MEMOIRS

OF

THE ROYAL CALEDONIAN HORTICULTURAL SOCIETY

JOHN H. WILSON, D.Sc., F.R.S.E., *Honorary Editor*

ROYAL BOTANIC GARDEN
16 NOV. 08
EDINBURGH

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CONTENTS

PAGE

MR PATRICK NEILL FRASER 83

MR DAVID PRINGLE LAIRD 85

NOTES ON VEGETABLE CLASSES AT THE INTERNATIONAL SHOW. By ALEX. DEAN 87

IMPRESSIONS OF THE INTERNATIONAL SHOW—FLOWER DEPARTMENT. By E. MOLYNEUX 89

GRAPES AT THE INTERNATIONAL SHOW. By WM. CRUMP, V.M.H. 93

IMPRESSIONS OF THE INTERNATIONAL SHOW. By DAVID THOMSON, V.M.H. 94

NOTES ON THE EXHIBITS OF HARDY FRUITS AT INTERNATIONAL SHOW 96

COOL ORCHIDS (*with Illustration*). By R. BROOMAN WHITE . 100

BRITISH FERNS AND THEIR VARIETIES (*with Illustrations*). By CHARLES T. DRUERY, V.M.H., F.L.S. . . . 106

[*Continued on Outside Back Cover.*

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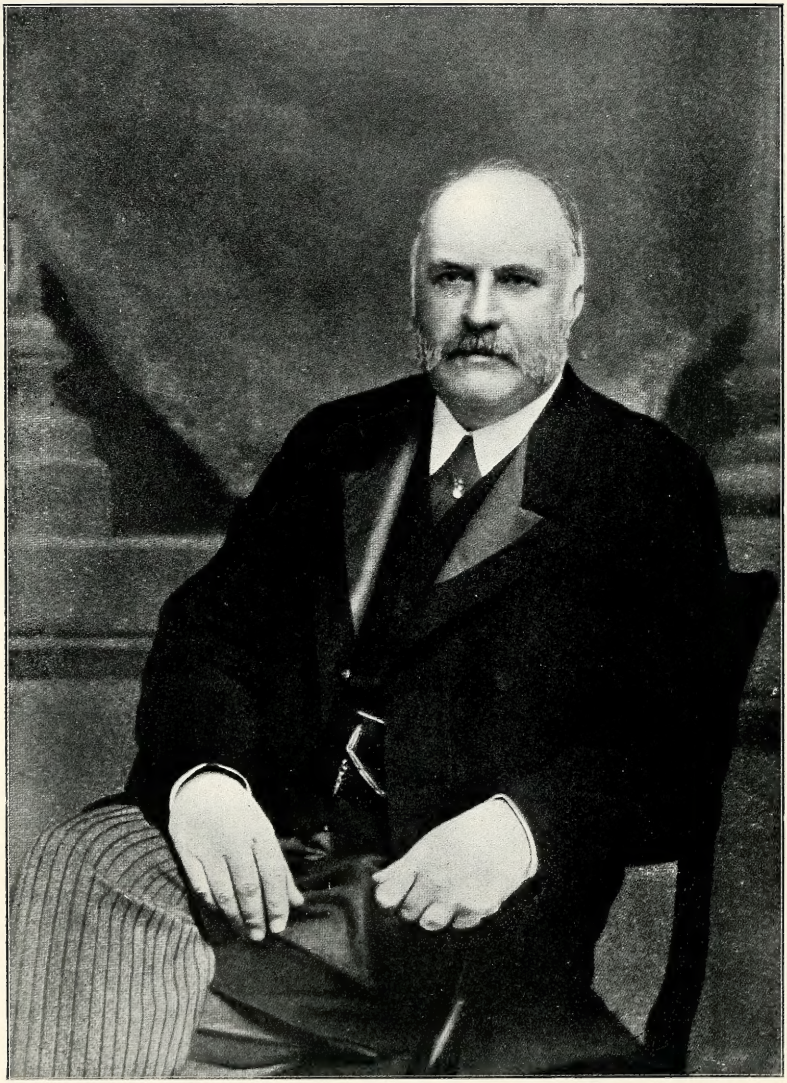


THE RIGHT HONOURABLE LORD BALFOUR OF BURLEIGH, K.T.
PRESIDENT OF THE SOCIETY

MEMOIRS

OF THE

ROYAL CALEDONIAN HORTICULTURAL SOCIETY.

Mr PATRICK NEILL FRASER.

THE death of Mr Patrick Neill Fraser on the 27th of February 1905 removed a well-known figure from botanical and horticultural circles in Scotland. Mr Fraser was a member of the old established printing firm of Neill & Co., with which he was connected from his earliest manhood. In spite, however, of the exacting duties of his business he managed during the whole of his life to find time for the study of botany and the cultivation of plants, and when he removed to his beautiful residence at Rockville, Murrayfield, he had ample scope for the indulgence of his favourite pursuit. He paid special attention to Ferns, but he loved plants of all kinds, hardy and tender, alpine and herbaceous. Mr Fraser's hobby was his garden. He spent his leisure time in it, and he had no greater pleasure than in exhibiting his treasures to his friends.

Mr Fraser was best known as a cultivator of Ferns. He had gathered them from all parts of the world, and was very successful in his treatment of them. Some of his exotic ferns were magnificent specimens which carried off numerous prizes at the shows of the Royal Caledonian Horticultural Society. He spared himself no pains in acquiring new species. In the spring of 1896 he undertook an expedition to Jamaica to study in their native habitats the Filmy Ferns for which that lovely island is famous. The writer well remembers the enthusiasm

with which he would climb to an altitude of 5000 or 6000 feet, and labour with restless activity for hours in the close damp heat, returning in the afternoon with two heavy bags of spoil slung upon his back. It was trying work for a man who was no longer young, but the ardour of the chase was upon him, and no difficulty was sufficient to daunt him. Many of the Filmies he brought home alive, and he had considerable success in growing them, although it is almost impossible to reproduce the natural conditions under which they flourish. He visited the island of Grenada, and from there also added to his stores. All Ferns, however, were equally interesting to him, and he possessed a remarkable collection of varieties of the British species.

His rockeries were extensive, but he had not quite the same success with alpines as with Ferns. He had a great number of them, however, and many of them were interesting. An old quarry hole in his grounds, which in other hands would have been an eyesore, he had transformed into a thing of beauty, planting the slopes with fine shrubs, cutting walks through them, forming rockeries along the paths, and filling up the margins of the water with water-plants. Everywhere evidence was seen of horticultural knowledge and taste.

Mr Fraser was connected with several scientific societies. At his death he had been a member of the Botanical Society of Edinburgh for fifty years, and for some time he acted as its treasurer. For twenty-seven years, until 1898, he filled the same office in the Royal Caledonian Horticultural Society; in 1892 his services were acknowledged by a presentation of silver plate. He was a Fellow also of the Royal Society of Edinburgh, and of the Scottish Alpine Botanical Club, whose excursions to the Highlands he attended until he was no longer fit for mountain climbing. He joined the Royal Scottish Arboricultural Society shortly after its foundation half a century ago. He did not contribute much to scientific journals, but the papers he wrote from time to time were characterised by fulness and accuracy of knowledge. Possessed of a good botanical library, especially rich in works of reference, and aided by his voluminous and carefully arranged notebooks, he was able to put his finger in a few moments on reliable information regarding any plant for the benefit of the friends who consulted him.

His herbarium of Ferns was particularly good, embracing specimens from all parts of the world.

His business and his gardening were the two main occupations of Mr Fraser's life. He was of too retiring a disposition to be in any sense a public man; his modesty prevented him from pushing himself forward. He loved a quiet and peaceful life. By his friends he was much esteemed and liked for his straightforward honesty, his kindly and obliging disposition, and the urbanity of his manner. Many remember him and regret his loss.

DAVID PAUL, M.A., LL.D.

Mr DAVID PRINGLE LAIRD.

On the eve of the International Show, in September 1905, quite a gloom was cast over many, both inside and outside the Society, when it became known that Mr D. P. Laird, who had left Edinburgh but a few days before in the most buoyant of spirits, and with the intention of being back in time to take part in the proceedings connected with the great exhibition, had come by a sudden and tragic end. It was indeed a rude shock to his many friends and acquaintances.

Mr Laird took a deep interest in the affairs of the Society, and he was one of the most active of its members. For several terms he served at the Council Board, and for one term he was a Vice-President; and while he served in the latter capacity, when he usually had to preside at the meetings, those who sat round the table with him will long remember the fine tact with which he conducted the business, and the good humour in which he always kept everyone.

Mr Laird was born in 1853, and was educated at the Edinburgh Institution, Dr John Nisbet, late of the Indian Forest Service, being one of his schoolmates. He afterwards entered the nursery and seed business of Downie, Laird & Laing, of which firm his father was a partner, and at the time of his death he was the senior managing director of the firm of R. B. Laird & Sons, Limited. In the early seventies he spent two years in Ceylon, and on his return to Edinburgh he resumed

his connection with the business with which his family had so long been associated.

With the affairs of the sister Society, the Scottish Horticultural Association, Mr Laird was closely identified. He was one of the founders of the Association, and its first Treasurer, in which capacity he acted for several years afterwards. He served for a number of terms as a Councillor, and also as a Vice-President, and in 1887 he was elected to the presidential chair. In forestry matters, too, he took a deep interest, and for many years he was intimately associated with the Royal Scottish Arboricultural Society, in the affairs of which, as Councillor and Vice-President, he took a prominent part; and when, after the death of Mr Dunn, it fell to him as Convener of the Excursion Committee to lead the excursion party in their annual outings, it may be truly said that no more genial leader ever took them in hand.

Mr Laird also found time to devote to public affairs, and in educational and other matters connected with the parish in which he resided, Corstorphine, his services were much sought after. At the time of his death he was a member of the Parish Council and of the School and several other Boards.

When hard frost brought nursery work to a standstill, the attractions of the curling pond were to him irresistible, and by none will his companionship be more missed than by those devotees of the "roaring game" amongst whom he was so singularly popular.

A. D. R.

BACK ROW—

3rd ROW—

W. H. Lees. Wm. Fyfe. J. Whitton. N. F. Barnes. D. W. Thomson. J. C. Fraser.
T. Fortune. J. F. M'Leod. F. W. Moore. M'Kellar. Jas. Harvey.
P. Blair. R. P. Brotherston. M. Campbell. Geo. Monro. W. Jamieson. Tallack. W. T. Wright. Robt. Fife. N. Bryson.
J. Edmonds. T. Wilson. Wyatt. Ex-Baillie M. Campbell, D. Inglis. S. Arnott. Robt. Harkness. A. D. Richardson. David Thomson.
Glasgow.

2nd ROW—

J. W. M'Hattie. R. Brooman White. J. Whytock. W. Henderson. J. Fraser Smith. T. S. Wright. J. M'Indoe. Jas. Douglas. F. W. Burbidge. Chas. Blick. J. Methven.
Lt.-Col. J. Campbell. C. W. Cowan. T. Hogg. Chas. Webster. W. Crump. R. Irwin Lynch. D. Kidd. Geo. Paul. John Andrews. W. Smith.

FRONT ROW—

J. Troup. J. Cocker. John Smellie. J. Hudson. G. Bunyard. Pearson. Lord Balfour of Burleigh, *K.T. President.* Rev. W. Wilks. J. Cairns. W. Melville.
T. H. Cook. Harry J. Veitch. W. H. Massie. P. Murray Thomson, *Secy.* H. B. May. A. Melville. J. Grieve.

INTERNATIONAL SHOW, 1905. Group of Council, Judges, Royal Horticultural Society Deputation and Others.

GENERAL VIEW AT INTERNATIONAL SHOW.

NOTES ON THE VEGETABLE CLASSES AT THE INTERNATIONAL SHOW.

By Alex. Dean, Kingston-on-Thames, Surrey.

It is very doubtful whether at any time in the history of vegetable competitions any exhibit had ever before created such lively interest as did the class offered by this Society for 24 dishes of distinct varieties of not less than 12 kinds at this International Show. The prizes offered, four in number, and of the total value of £51, largely exceeded in value any known to have been previously offered, and thus made the class a veritable champion competition. Special interest also attached to the class because the schedule insisted on the positions of the respective exhibits being determined by points, and it was fortunate that it was so, as otherwise it would have been impossible in the case of the chief exhibits to have arrived at any clearly defined conclusion. Point judging without doubt materially adds to the interest attached to such competitions; but whilst competitors and visitors like to ascertain exactly the numbers of points awarded in each case, experience unhappily shows that by their public exposure no end of disputation often results, crowds in a wrangling mood often gathering round the point cards, and thereby greatly incommoding the public.

Another special cause for interest in the competition was found in the knowledge that such famous English vegetable growers as Messrs E. Beckett and J. Gibson (although the latter is none the less a Scotsman) would compete, and thus present the very finest opportunity offered to enable English and Scottish growers to come into full and fair competition. These two competitors took first and second place respectively, and whilst a capable Scottish grower came third, there was a material difference between his and the preceding English-grown collections. Still his effort in this great competition merited all praise. Whilst the Scottish grower, Mr Harper, had to be

content with 122 points, another leading English grower, Mr Ashton, secured only 108½ points.

Apart from the superb quality seen in the exhibits of Messrs E. Beckett with 143½ points, and J. Gibson with 139 points, the setting up of the collections in each case was most elaborate and artistic, really in vegetables alone creating veritable works of art, and helping to make these splendid exhibits some of the most attractive features of the Show.

Turning to the purely Scottish class for 18 dishes only, whilst there was good competition, the average quality was less high. Mr Beckett's collection gave an average of 6 points to each dish, and Mr J. Gibson 5⅝ths. The first prize collection in the Scottish 18 dishes, that of Mr R. R. Gibson, with 96 points, gave an average of 5⅜ths. As the second prize collection obtained 94 points, the relative point proportions were in this case very similar to that seen in the first and second exhibits in the open class.

In the smaller classes for vegetables, and more especially in those for Potatoes, Scottish growers held their own most ably. Better samples than were those staged by Messrs M'Pherson, Gemmell, and M'Rae have seldom been seen. Peas, especially the Scots-raised Gladstone, Leeks, Onions, Celery, pots of Parsley, Cauliflowers, and all other vegetables were generally of superb quality and excellence. These vegetable competitions were indeed something of which the Exhibition Executive might well be proud.

The contrast seen between the French vegetable exhibits, so kindly staged by the great Paris seedsmen, Messrs Vilmorin, Andrieux and Co., and those of British growth was remarkable.

The trade exhibits as a whole, but especially those of Potatoes, called forth very high commendation.

The association in the judging of the vegetable classes of English and Scottish censors was a happy conception.

FIRST PRIZE DISPLAY OF VEGETABLES AT INTERNATIONAL SHOW.

Exhibited by E. BECKETT, Aldenham House Gardens.

IMPRESSIONS OF THE INTERNATIONAL SHOW—FLOWER DEPARTMENT.

By E. Molyneux, Swanmore Park, Bishop's Waltham, Hants.

For some months before the Show I had spent much thought on the display which I anticipated, and when the opening day arrived I was not disappointed. Although there were not many outstanding features beyond what one would expect in such a large number of well-thought-out classes as were seen on this occasion, the display was, on the whole, the finest I have seen during thirty years of horticultural travel in the United Kingdom and on the Continent, and nowhere else have I seen such general excellence as was exhibited here. But while this is so, I do not mean to imply that some of the exhibits have not been surpassed in excellence at some time or other. One exception, however, must be made, and that is vegetables. These, I have no hesitation in saying, were superior to any which have yet been exhibited. It is not on vegetables, however, that I purpose making any remarks I have to make, but on the Floral display.

Arriving in Edinburgh two days before the Show, I had ample opportunity of noting the arrangements which had been made, and when I saw the chaotic state in which the Waverley Market was at 10 a.m. on Tuesday morning, I marvelled at the result twenty-four hours later when the Show was ready for opening.

Mr Murray Thomson and his willing band of workers will never forget those hours, I am sure. If ever a man was required in ten places at once, Mr Thomson, I am certain, holds that record.

The grumbling of the exhibitors alone, at what they considered to be want of arrangement, was sufficient to fill one with dismay. Being in the position of an "unemployed," I had ample opportunity of hearing and seeing what was going on. My reply to the confiding growler—the exhibitor who expects

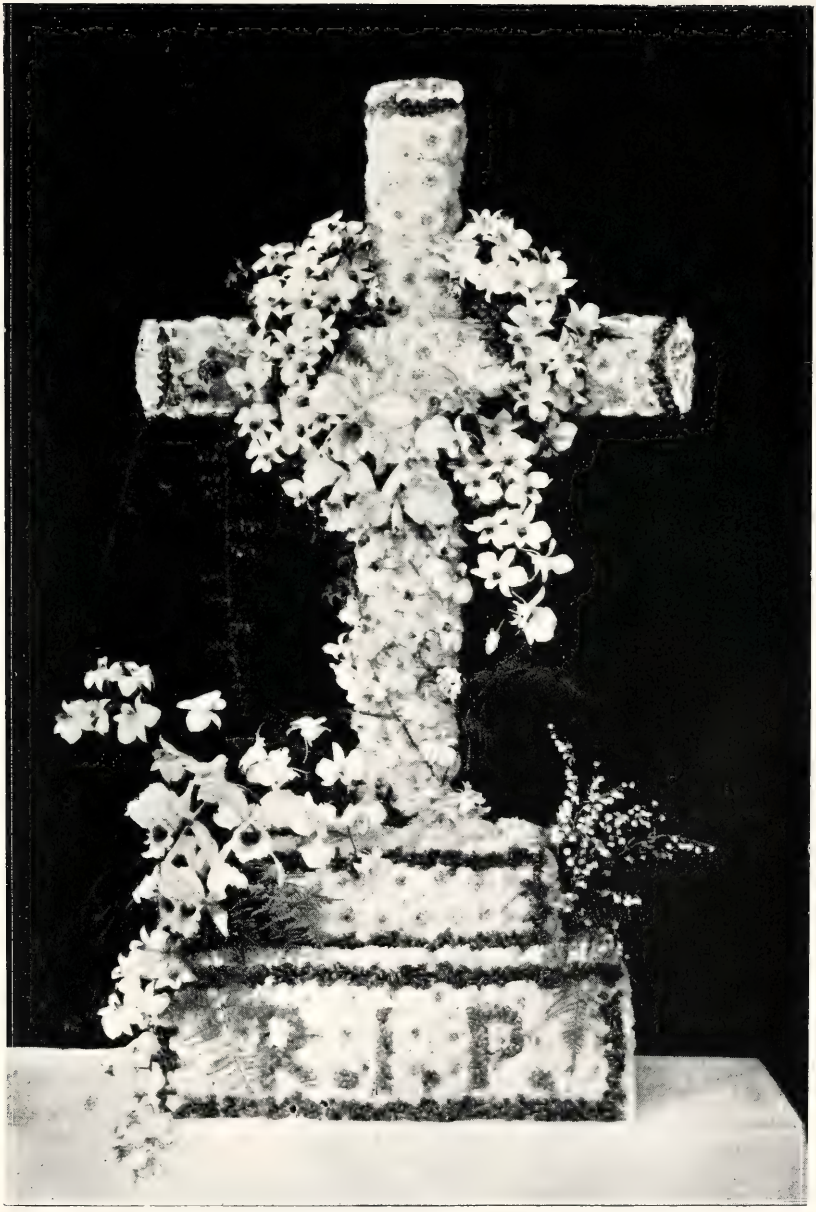
to find everything in apple-pie order—was invariably the same: "Give the man a chance; if you had half as much to do and think about, and at the same time try to be courteous to all, as he has, I guess you wouldn't do any better." The reply came quickly and warmly, "It's all very well for you; you have nothing to do; I have a lot to do." But when night fell on the first day of the Show these same grumblers, especially the prize-winners, were loud in their praise of the arrangements.

Now, as to the Show itself.

The groups of plants arranged for effect were extremely fine, were, in fact, superior to any exhibits of the kind hitherto seen in Scotland. Some of the finest Crotons imaginable were shown, exhibiting the highest possible cultivation, and the way in which the first prize group was displayed no doubt did much to secure for the exhibitor the leading award. Foliage plants in small pots are invariably a feature of Scottish exhibitions. Nowhere in England can their equals be found. British Ferns were indeed a feature, but rather in point of quality than in the large size of the plants. The Welsh Polypody (*Polypodium vulgare*, var. *cambricum*) especially was of high merit in cultivation. The Scolopendriums, too, were much superior to what one is accustomed to see in England.

In the non-competitive groups the exhibits were remarkable. Of great interest was the varied and unique exhibit from the Corporation of Glasgow, so excellently arranged by Mr Whitton, the Parks Superintendent. Plants there were in this group which are rarely seen outside of a Botanic garden, and yet they are so interesting. Messrs J. Veitch & Sons, Chelsea, had one of their characteristic displays. Crotons, Alocasias, Dracænas, with Nepenthes, etc., found a host of admirers. Mr D. W. Thomson, Edinburgh, had a wonderful display of retarded plants in flower, exemplifying well the method of controlling the flowering period of plants at will.

In the cut flower department there was an immense display. Roses, considering the late period in the season, were remarkably fine, and so differently arranged from what one usually finds to be the case. Messrs J. Cocker & Sons, Aberdeen, must have given an envious pang to those exhibitors who stuck to the flat box method of arranging cut blooms when they saw the exquisitely fine arrangement in the competitive class which



FLORAL DESIGN AT INTERNATIONAL SHOW.
Exhibited by FELTON & SON, London.

they had set up, bold masses of superb blooms in bamboo stands with their own foliage being used. "Caroline Testout," "Mme. Abel Chatenay," and "Frau Karl Druschki" were immense in size and quality. In the smaller classes also were many noteworthy exhibits.

Gladioli were admirably represented, and were much finer than we see them in England as a rule, although the premier exhibit came from Northumberland. "Chloe," "Fra Diavolo," "Sceptre," "Des Fleurs," and "Lord Salisbury" were remarkable for the high quality of their flowers. Dahlias were exceedingly fine, especially the *Show* varieties exhibited by Mr J. Smellie, the huge size and superb finish of which were their leading attributes. This exhibitor also proved that he can grow the Cactus section equally well. I cannot, however, admire the method so commonly adopted of securing the blooms to flat black velvet-covered boards. They were certainly worthy of better treatment. Sweet Peas were marvellously well grown, and well staged. Their size of petal, lustre in colour, and freshness in appearance were such as we in England—in the southern counties at any rate—cannot obtain. Carnations were variable. Some handsome flowers were shown, but many were otherwise.

Hardy flowers were contributed in enormous quantity, but I must confess to disappointment in not finding any new feature either in arrangement or in variety; but perhaps constant visits to the Temple Show in London are apt to make one too exacting in this respect at other shows. Pansies and Violas were exhibited in large numbers. Although taught from a mere boy to appreciate the Pansy, I cannot for the life of me see what others so admire in these flowers; and though I have no doubt whatever as to the quality of those which were staged here, I cannot but say that Pansies are not desirable flowers from a utilitarian point of view.

Violas were of special merit, and were effectively displayed, the delicate tints being simply charming, and the more one examined the flowers, the more handsome did they seem to appear. For Scotland, Pentstemons were exceptionally poor. Having a strong penchant for this flower, I had left a large gap in my imagination to be filled by what I was to see here; but, alas! the good blooms were non-existent.

The Table Decoration and Floral Classes were a new feature in Edinburgh, and created much interest. The site selected for the exhibits, however, was not of the best, as many of the magnificent wreaths, crosses, and bouquets could be but indifferently seen, placed as they were under the gallery.

Messrs Felton & Son, London, had a most gorgeous first prize table of Orchids, all displayed without a semblance of crowding, an object-lesson of this common fault to many exhibitors.

Taken as a whole, the display was varied, interesting, and certainly educational; and to me not the least interesting feature of it was the discussion which I had with Mr Murray Thomson, Mr M'Hattie, and Mr Richardson over the knotty question of protests and disqualifications which crop up so frequently at shows.

FIRST PRIZE TABLE OF ROSES AT INTERNATIONAL SHOW.

GRAPES AT THE ROYAL CALEDONIAN SOCIETY'S INTERNATIONAL SHOW.

September 1905.

By Wm. Crump, V.M.H., Madresfield Court, Malvern.

Everybody expected to see a good display of high quality Grapes at this show. Taken as a whole, the exhibits were not disappointing; they were, however, not uniformly good, for whilst the size, quality, and finish of many of the varieties were grand in the extreme, others were very indifferent, rendering the exhibits quite unworthy of the valuable prizes offered by this enterprising and up-to-date Society. In fact, so inferior were the exhibits in some instances that the judges withheld the first prizes. But these remarks refer chiefly to the smaller or single-bunch classes.

The varieties best represented in the exhibition were Muscat of Alexandria, Chasselas, Napoleon, Appley Towers, and Madresfield Court, and there were splendidly staged bunches of these by Mr J. Beisant, Castle Huntly, in competition for the Scottish Challenge Trophy for eight bunches of grapes, given by Mr W. H. Massie.

It was evident from the points awarded that the judges had set a very high standard. No bunch gained the maximum number of points, which was doubtless a correct decision; but if the two bunches of Muscat of Alexandria, staged in Class 9, by Mr W. Galloway, gardener to the Earl of Wemyss, Gosford, had been point-judged by the same high standard, maximum marks would have been unanimously awarded. Indeed, it was the unanimous opinion of the judges that nothing finer or nearer absolute perfection of their kind had ever been staged before. Bunches, berries, and colour were grand, and the exhibit was quite worthy of the award of His Majesty the King's Cup, offered for the best fruit exhibit in the Show.

IMPRESSIONS OF THE INTERNATIONAL SHOW OF 1905.

By David Thomson, V.M.H., Eskbank, President of the Judges.

The International Show of 1905 was without doubt by far the most extensive exhibition of the kind ever held in Scotland, and as a whole it may be characterised as the best and most effective of these exhibitions. Looking back to the first International Exhibition, promoted by the Edinburgh Horticultural Society, in 1865, and contrasting the two shows, the difference in extent is very marked. Then the Music Hall, in George Street, afforded sufficient space for the Floral exhibits, and the adjoining Assembly Rooms accommodated the Fruit exhibits. The exhibits of 1905 filled the interior of the spacious Waverley Market in all its parts, and overflowed extensively on to its roof.

A striking feature of the Show was the very much larger proportion of nurserymen's exhibits as compared with what was seen at former shows, and perhaps the next most striking feature was the great falling off in the number of large landowners whose names appeared in the list of exhibitors.

On this occasion a great improvement in the quality of the trade groups of miscellaneous plants staged for effect was very evident, and by staging them on the floor a great improvement was effected in the appearance of the Show generally. In these groups, too, a new departure was manifested in the transference, by retardation, of spring-flowering plants to the autumn-flowering groups. In flowering stove and greenhouse plants there was a very marked falling off, and the entire absence of those grand specimens of hard-wooded Heaths and other greenhouse and stove plants which appeared at the earlier International Shows from the gardens of various noblemen, and which formed the most severe tests of high and persistent cultural skill, was very much to be regretted.

The display of Roses, Carnations, Dahlias, Gladioli, Begonias,

KING'S CUP.

Awarded for the Best Exhibit in the Competitive Fruit Classes.

Won by JAMES BEISANT, with Eight Bunches of Grapes.

Appley Towers.
Muscat of Alexandria.

Chasselas Napoleon.
Appley Towers.

Madresfield Court.
Muscat of Alexandria.

Chasselas Napoleon.
Madresfield Court.

SCOTTISH CHALLENGE TROPHY CLASS OF GRAPES AT INTERNATIONAL SHOW.

Exhibited by JAMES BEISANT, Gardener to Mrs George Armistead.

etc., was unrivalled by that of any former Show, and perhaps the most marked improvement observed in these was in the collection of double and single tuberous Begonias exhibited by a trade firm from England.

Turning to the Fruit classes, which were very extensive as compared with previous International Shows, one could not but be impressed by the large number of bunches of Grapes shown ; but I think it was quite evident that the proportion of inferior bunches was very great as compared with what has been seen on former occasions. The very best in quality fell considerably below the examples that were staged in 1865, and in later years, from England and Scotland. Especially does this apply to Muscats and Black Hamburghs, which are the true test of cultural skill. For the heavy bunches, too, the exhibits fell far below those of former shows, at which bunches from 20 lbs. to 26 lbs. in weight were exhibited.

It was generally conceded that the exhibition of vegetables was the outstanding feature of the show, and the display as a whole was very meritorious. In the collections especially the quality was remarkably fine, and the way in which these were staged was really most effective.

In looking back to forty years ago, and taking into account the way in which fruits and flowers were then staged for exhibition, one cannot but be struck by the very great improvement in the way in which flowers and fruit are now conveyed and staged as compared with the methods which were then in vogue, and this applies more especially to Grapes and other tender fruits. The reference to improvement is quite as applicable to all the other arrangements connected with shows as it is to the conveying and staging of the exhibits.

NOTES ON THE EXHIBITS OF HARDY FRUITS AT THE INTERNATIONAL SHOW.

By Charles Webster, Gordon Castle, Fochabers.

The magnificent display of hardy fruit at the late International Show of the Royal Caledonian Horticultural Society was, to those who had the pleasure of seeing it, an object-lesson in many ways. The handsome prizes offered by the Society and the advantage of a fine season induced strong competition in nearly all the classes, and the very finest fruit was shown.

Taking Apples first, as being more extensively exhibited than any of the other fruits, what struck one most was the high colour and finish of the English and Irish exhibits as compared with the Scottish ones. The English and Irish fruit seemed more like what we are accustomed to find in the orchard house than from trees grown in the open air. That fine exhibition sort, "Peasgood's Nonsuch," was oftener shown than any other kind, and there were some exceptionally fine dishes of it amongst the collections; but although one of the best varieties for show purposes, it is not a profitable one to plant extensively. Some of the newer sorts that have been raised either by using the pollen of this variety or making it the seed parent, such as "Chas. Ross," "Rival," and "Coronation," were to be seen in some of the collections, but it is doubtful if ever they will be so extensively grown or become as popular as "Peasgood's" is. It is not many years since "James Grieve," "Newton Wonder," and "Allington Pippin" were put into commerce, but they have already made a name for themselves, and they were to be seen in nearly every collection. They are all sterling good kinds, and will be more extensively planted when their merits become better known. Of sorts that have been recently introduced, "Langley Pippin," "Ben's Red," "King Edward VII.," "Norfolk Beauty," and a few more promising new sorts which are likely to be seen at future internationals, were observed. Amongst those older kinds which still keep their place on the exhibition

TWELVE DISHES OF FRUIT AT INTERNATIONAL SHOW.

Exhibited by J. H. GOODACRE.

EXHIBIT OF APPLES AT INTERNATIONAL SHOW.

table, and which were represented by almost perfect samples, may be mentioned "Warner's King," "Ecklinville Seedling," "Lane's Prince Albert," "Worcester Pearmain," "Cellini," and a few others. In the exhibits of Messrs Veitch and Bunyard were some grand samples of all the newer and up-to-date sorts, as well as many of the older and well-known kinds. Both exhibits well upheld the reputation of these firms as pomologists of high standing.

There can be no doubt that the use of the Paradise stock has had a wonderful influence in bringing a good many sorts into an earlier fruiting stage than when grafted on the Crab stock; and where attention has been given in the way of mulching and exposure of the fruit to the sun, they also take on a much higher colour than when grown upon the Crab or free stock.

The English Pears from the open air were, like the apples, a long way ahead of the Scottish-grown fruit. The Show was, no doubt, held a little too early in the season for the late sorts to be seen at their best, but nevertheless there was a great difference both in size and colour between the English and Scottish samples. Some sorts do very much better in some districts than in others, but there are a few general favourites which seem to succeed in most places, and these were to be seen in nearly every collection. That finest of Dessert Pears, "Doyenne de Comice," was shown more frequently than any other sort, and there was scarcely a collection without a dish of it. "Louise Bonne of Jersey," "Souvenir du Congrès," "Marie Louise," and "Pitmaston Duchesse" were staged more or less in every collection, and they would seem to succeed in nearly every part of the country.

Of the newer kinds that were more frequently seen than others, "Margaret Marillat," a large high-coloured fruit of taking appearance, was observed in a good many collections. Another variety of very high colour not often seen in Scotland was "Beurre Mortillet," and the best-coloured dish of Pears in the Show was one of this variety. The whole of the Pears were of great excellence, and one rarely has the opportunity of seeing so many choice varieties exhibited at one time. What the Paradise stock has done for the Apple, the Quince has done for the Pear, and it has enabled growers to get their

trees into a very much earlier fruiting condition than could have been done by using the Pear stock. In dry seasons, however, it is essential that trees carrying a crop of fruit should be well mulched and watered, otherwise the fruit will fail to swell as it ought to do.

The classes for the collections of Plums were well contested, and the fruits, both from under glass and outside, made an excellent display. The fruit from the inside had a grand bloom, and the winning lots were especially fine. The number of seedlings raised by Messrs Rivers, as compared with the number of older kinds which was shown, bore testimony to what these pomologists have accomplished in the raising of new varieties, not a single competing collection being without one or more of their raising in it. "Grand Duke" and "Monarch," as well as others of their raising, were seen in every collection among cooking Plums, while "Late Orange" and "Late Transparent Gage" appeared several times amongst the Dessert varieties. Coe's "Golden Drop" still maintains its place as being the best late Dessert Plum in cultivation, being among Plums what the Black Hamburgh is among Grapes.

There are few hardy fruits which respond more quickly and give better returns to glass protection than do Plums. They rarely fail to carry a crop, either when planted out or in pots, if they receive proper attention.

Apricots, Peaches and Nectarines were not shown to the extent that could have been wished, but in the case of Apricots the season was almost over. The dull and sunless weather in the early part of September no doubt had the effect of retarding the outside fruit, and both Peaches and Nectarines that were staged were chiefly from plants grown under glass. There was nothing of outstanding merit in any of the exhibits to call for mention, and better dishes have been seen at ordinary shows of the Royal Caledonian Society on former occasions.

For the collection of hardy fruit there was only one competitor, but as the class was an open one, some were no doubt deterred from making an attempt who otherwise would have competed. I think, however, that Scotsmen would have had as good a chance as their neighbours from over the border. What they lost in some varieties of fruit they would have made up for in others.

INTERNATIONAL SHOW, 1905. GROUP OF ECONOMIC AND OTHER PLANTS.

Exhibited by CORPORATION OF GLASGOW. Mr JAS. WHITTON, Superintendent of Parks, etc.

For Cherries and bush fruits the season was too far over, and only a few were staged, but the few Morellos that were staged were excellent samples.

The display of hardy fruits was, all over, a most excellent one, and I should think was an advance upon any previous International Exhibition; especially was this the case in the Apple, Pear and Plum sections.

COOL ORCHIDS.

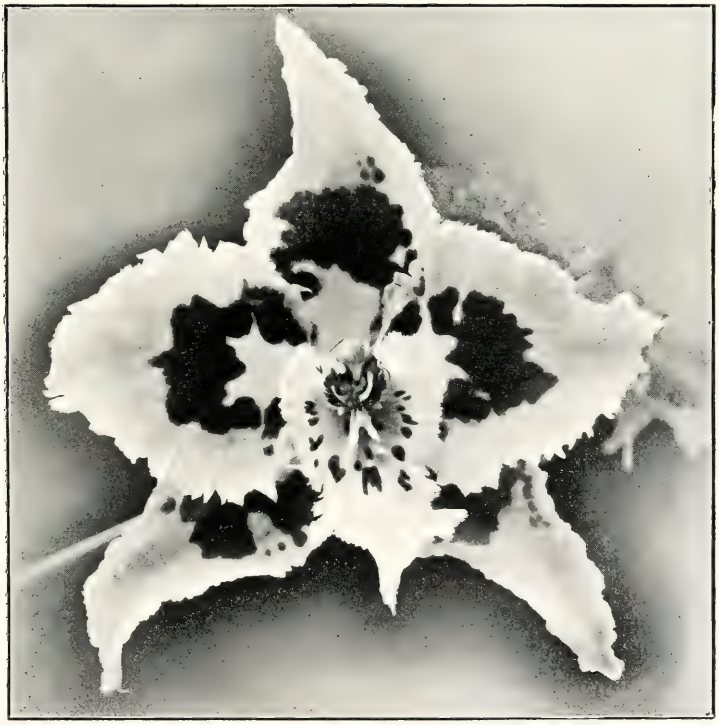
By R. Brooman White, Arddarroch, Garelochhead.

"I cannot afford to grow Orchids" is a remark which has become so hackneyed that were I to retort, "There are many Orchids which can be grown as cheaply as Geraniums, or, at any rate, as cheaply as ordinary stovehouse plants," many of my readers would be sceptical. Yet such is the case; and to prove that it is so, the matter only requires to be put to the test.

Among cool Orchids, *Odontoglossum crispum*, the "Alexandra" Orchid of common parlance, the easiest to grow and flower of the whole genus, takes first place. As applied to these plants, the term "Cool" implies that they come from high altitudes; and when it is mentioned that in the Colombian Andes they grow up to an elevation of 12,000 feet above sea-level, the significance of the term will be fully appreciated.

The requirements of a cool Orchid like *Odontoglossum crispum* (and for my purpose I will include under the term "crispum" not only the species of that name, with its hybrids and varieties, but such allied species as *triumphans*, *gloriosum*, etc.) are briefly these:—(*a*) A light, airy house that can be well ventilated, and kept damp at will. Though they will grow in almost any locality, in Scotland at any rate, except perhaps in some hot situations, an independent house with span roof, walls to the roof (*i.e.* without glass sides), and top and bottom ventilators is to be preferred. (*b*) A tank or tub in which to keep water at the same temperature as that of the house. As a regulation minimum, a temperature of 50 degrees should be aimed at, though in very cold weather, when it would be difficult to maintain this, a temperature as low as 45 degrees will not hurt the plants, if they are kept proportionately dry at the roots at the same time. In the hottest weather the temperature of the house should never exceed 75 degrees if possible, though, if the plants are kept wet, a higher tempera-

ture occasionally will do no harm. Modifications of this temperature, according to weather and other conditions, will, however, soon suggest themselves to the thoughtful would-be grower of crispums. (*c*) The house should be shaded by a blind of cotton shading or laths, made so that it can be easily rolled up and down at will.



[*Photo by Mr Chapman.*

Good type of Orchid, from collection of Norman Cookson, Esq.

The plants can be purchased from the importers, or at auction sales of imported plants, at from 1s. to 5s. and upwards each, according to size. For the tyro in crispum growing it is better, perhaps, to begin with plants at 2s. 6d., and to continue with these for a while, as they will be better subjects to work upon than any of the other sizes. From amongst imported plants all the most valuable forms of *Odontoglossum crispum* which have

appeared from time to time, and which have created such sensations in the Orchid world, and in the Press, have been obtained. When the plants are gathered from the trees they are dried in order that they may withstand the journey through the hotter parts of the country at lower levels, and across the ocean; and when they arrive here all that is necessary is to resuscitate them. This is done by laying the plants on tiles, or stage battens, with a little moisture-retaining material, and syringing them, great care being taken not to give too much water at a time till they begin to "plump up." They will then produce roots and growth from the "lead," which is the last-made pseudo-bulb, and they should then be potted.

As a general rule, the more porous the pots the better will the plants grow, though this has been proved not to be an inexorable rule by an English grower who has introduced glass pots with excellent results in the cultivation of his own collection. The size of the pot, however, is important, and it may be stated that it should never be larger than what is just sufficient to enable the plant to form its next bulb comfortably. The potting material varies greatly according to position, climate, country, and the ideas of the cultivator; but, speaking from my own experience, and judging from the condition of my own plants, the following will, I think, be found a good basis whereon to work. First, "crocks," or potsherds, should not be used for drainage. This practice is now abandoned by all the best growers, and the rhizomes of the common brake fern, found in the peat formed from the debris of this plant, are used instead. These should be well "baked" before using, in order to kill any germs or fungus-mycelium which may adhere to them. They should be cut into pieces 1 to 2 inches in length, and two-thirds of the pot should be filled with this material, to act as drainage; and the remainder should be filled with a compost consisting of one-third good fibrous peat, one-third oak leaves, and one-third sphagnum moss, with a little sharp sand. The oak leaves should be gathered soon after falling, and they should be stored under cover for about a year in order to prevent them from rotting, as actual decomposition dissipates the nutriment they contain, and defeats the object in view in adding them to the peat; and it is advisable to have a

layer of rough ashes beneath them so as to prevent the ingress of worms. The leaves should be rubbed through a sieve of half-inch mesh in order to break them up a little, and the peat should be broken up into pieces not larger than a hazel-nut. The peat should be well incorporated with the sphagnum, and this and the oak leaves should then be well mixed together, a little silver sand being added to keep the compost open, and in this the plant should be firmly potted. Water should be judiciously applied, and the greatest care should be taken not to overwater the plants. On hot summer days water finely sprayed over the plants is very beneficial. Fumigation is necessary in order to destroy insects; but tobacco paper or cloth should never be used. The best insecticide with which the crispum grower has yet been provided is undoubtedly "XL ALL." The observant amateur cultivator will soon ascertain from the appearance of the plants whether all goes well with them. If the conditions are favourable, growth will be strong; but should the reverse be the case, advice should be sought from someone who can give the necessary information to his less fortunate fellow-cultivator.

In due time the flower spikes will appear. As a rule, strong plants bloom the year following importation, though of course they do not show their full beauty till after they have become quite established. Now it is that the interest commences in real earnest. Day by day, night by night, the developing buds are watched by the expectant cultivator in order to see whether he is to obtain a great prize or but an ordinary form. If it be the former, great is his joy; if the latter, then, as "Hope springs eternal in the human breast," he betakes himself to the other spikes, there to watch with the same intent interest as he did before. That prizes, and great ones, *do* come is matter of common knowledge; and as all the plants are gathered in a wild state, very few of them being seen in bloom by the collectors, the buyer of imported plants has always the chance of flowering something finer than anything that has yet been seen. The highest price hitherto paid for a *crispum* variety is £1500, and this for a plant which would have gone into an ordinary glass tumbler. Many plants have been sold at sums ranging from £500 to about £1000. Scores have realised from

£100 to £200, while hundreds of examples exist which have realised £50. I have seen plants in bloom which cognoscenti would call rubbish sold for 4s. per dozen. The tyro gloats over such purchases at first; in time he becomes one of the cognoscenti, and then he too considers them rubbish. I know one grower who at a certain auction sale bought three plants for 19s. One of these, which he named after himself, turned out a very fine form, and the plant has been valued at no less than £800. In nature, these fine forms are no doubt produced by insect agency. Many species very frequently grow in the same forest; and the endless crossing and re-crossing of species and of their hybrids and varieties which has taken place has resulted in the evolution of these forms, and this in a manner which the hybridist has as yet failed to discover. The beautifully spotted forms are the most prized of all the Odontoglossums, and the more of these that flower the greater does the demand for such forms seem to be, and the demand for these fine forms is always widening as new growers appear.

One error into which the tyro generally falls is to leave the flower spikes too long. This exhausts the plants, and the spikes should therefore always be cut when they are fully developed, say when a fortnight old as a maximum. If this is done the plants will not suffer any harm.

The propagation of *Odontoglossum crispum* is easy enough when one understands how it should be done, but many a valuable form has been lost owing to want of knowledge of this important cultural operation. It is a difficult thing to explain in a short article such as this is how propagation should be carried out, but, generally, the best way is to sever the leading pseudo-bulb from its fellows when its growth has reached the height of 2 inches. The rhizomes from which the bulbs spring should be cut through with a sharp knife, and for a fortnight afterwards the plants should have dry treatment in order to facilitate healing of the wounds.

As cut flowers, crispums excel in beauty, and almost all of them last for a long time in the cut state, more especially if they are allowed to remain on the plant for about a fortnight after opening.

For cultural purposes, under *crispum* may be included such species as *triumphans, gloriosum, luteo-purpureum, Hunnewelli-*

anum, *Lindleyanum*, and such hybrids as *loochristiense*, *Andersonianum*, *Wilckeanum*, *Adrianæ* and *Coradinei*. These and the blotched crispums grow well together, and collectively they give to the lover of plants the greatest possible amount of enjoyment which the cultivation of any single genus can give.

BRITISH FERNS AND THEIR VARIETIES.

By Charles T. Druery, V.M.H., F.L.S., London.

It is a very curious fact, and one which is not so generally recognised as it should be, that the majority of our comparatively few British species of Ferns have distinguished themselves in the way of spontaneous variation far more than all exotic species put together—that is, of course, so far as actual wild sports have been discovered. Furthermore, a number of types of variation have been discovered which have no counterparts or even approximations among exotic Ferns. As it is difficult to assume, despite the evidence to the contrary, that there is something in British soil or climatic conditions which induces variation here more than elsewhere, we are driven to the conclusion that the difference is largely due to the fact that for more than half a century the search for varieties in the British wild habitats of the normal species has constituted a special cult, pursued by a coterie of fern-hunters and raisers, with the remarkable result that the latest published list (E. J. Lowe, "British Ferns," 1891) describes and classifies nearly two thousand distinct forms, of which no less than eleven hundred were found wild. This great variability, coupled with the greatly enhanced beauty of many of the varietal forms, when it was first recognised, and some of the results found their way into the market, led, in the fifties, to a popularity which almost amounted to a craze. We judge of this by the still extant Fern catalogues of that time, where so large a number of inferior or merely "curio" forms appeared, at high prices, that the really fine symmetrical and constant forms were swamped. The result of the introduction of these erratics inevitably led to a reaction, and in a few years our British Ferns fell into the background, the "trade," with one or two exceptions, ceased to cultivate them, and the cult only survived in the coterie of amateur fern-hunters and raisers who had originated it. In their hands, however, it has not merely survived, but has

developed with such remarkable results that once again our native Ferns are attracting public attention. In the interim, the great number of new discoveries has led to two results, viz. the improvement of the best symmetrical and constant forms by selective cultivation through their spores, and the rejection of the erratic and merely curious types as breeders, the joint result] of which is that we have now a host of extremely

Fig. 1.

beautiful varieties which can not only hold their own with the finest exotics, but in many cases surpass them in beauty, or are even unique. British Ferns, therefore, are entering upon their new lease of popularity under far more favourable conditions than before, and if only the growers will refrain from debasing them by putting inferior forms before the public as representative ones, they are likely to hold at last their well-merited position of permanent favourites. One peculiar advantage attached to the study and culture of our native Ferns is thus seen to be that the Ferns which in so many

Fig. 2.

parts of the country are found in thousands in glens, woodlands, hillsides, and even by the roadsides, in the hedges, and on the walls, are capable, by careful search, of yielding these sports to serve, if merely curious or irregular types, as interesting

souvenirs, while there is always the chance of thoroughbreds turning up to swell the elite, and become, it may be, the progenitors of still more beautiful varieties. Scotland is, in the writer's experience, one of the most promising hunting-grounds, and at the same time one of the least

Fig 3.

explored, and this fact should strongly appeal to our fern-loving readers, and induce them to search more thoroughly. It may safely be stated that everywhere where Ferns are plentiful, there is a chance of a good find. These good finds, *i.e.* varieties distinct from the associated common ones, occur as a rule singly among the others, and are found by carefully scanning every individual. Much of the Fern may be so hidden

among its neighbours that its presence is only betrayed by a tip tasselled or curled, or otherwise varied from its neighbours, and only the successful hunter can know what a pleasure it is when, having detected such a clue, the clump of common Ferns is opened out and the completely characterised variety is seen in its midst as an independent thoroughbred. As a Scottish example of this kind, we may point to fig. 1 (*Athyrium Filix-fœmina revolvens*, Druery), found in Strathblane, and, as an Irish one, fig. 2 (*A. F.-f. cristatum Kilrushense*, Druery), found in a ditch by the writer in County Clare. Turning to Scotland again, fig. 3 shows a marvellously varied form of the common bracken (*Pteris aquilina*) found by the writer at Pitlochry, which, as can be seen by the photograph, is not merely extremely dense and crispy, but also tasselled at all tips. Above these, Scotland has the undoubted claim to the most remarkable Fern sport found in all the world, in the shape of *A. F.-f. Victoriæ*, the Victoria Lady Fern, or, locally, the Buchanan Fern, since it was found in a lane leading off the high road at Drymen, Stirlingshire, near Buchanan Castle. By fig. 4 it is seen that in this extraordinary form the side divisions of the frond are very narrow and set on in opposite couples at right angles, thus forming a series of crosses, the tips of which, moreover, are slenderly and gracefully tasselled, while the cruciate or crossed character extends even to the small subdivisions of the pinnæ. Nothing approximate to this has been found in other varieties, since, although we have ourselves found a cruciate form of Lady Fern, and there are several cruciate forms of the Soft Shield Fern (*Polystichum angulare*), these are only partially cruciate, somewhat irregular, and devoid also of the tasselling. Fig. 5 shows under what a commonplace environment this wonderful Fern originated. We may mention here as an amusing fact that the original Fern was divided, and part went to Buchanan Castle, where several fine specimens exist; and yet, when the Cryptogamic Society of Scotland visited the gardens there a few years back, in the published report not a word of this unique cryptogam was mentioned—nothing but fungi.

Having briefly described the position of our native Fern varieties as regards popular taste, and how those extant and under cultivation have been acquired, we may now try to give some idea of the diversity of form with which Dame Nature has

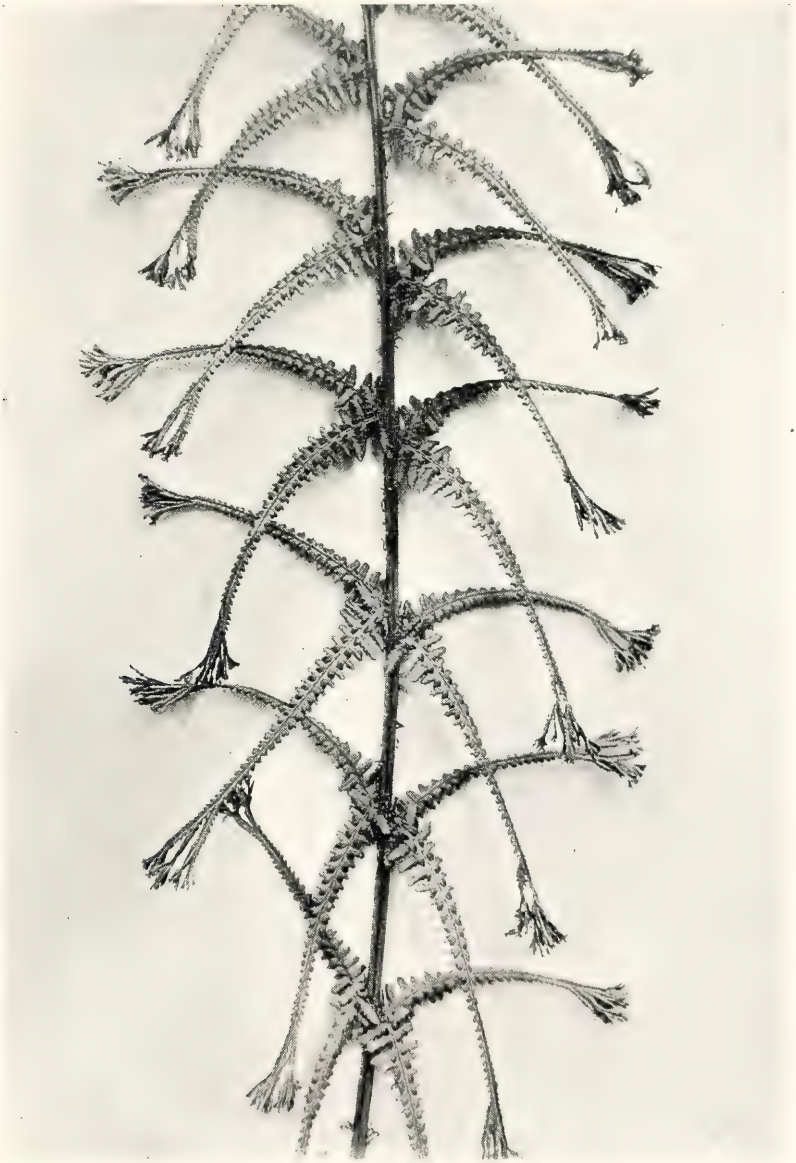


Fig. 4.

endowed the wild sports in the first place, and of the further development which man has been enabled to foster by careful selection among plants raised from spores, such selection un-

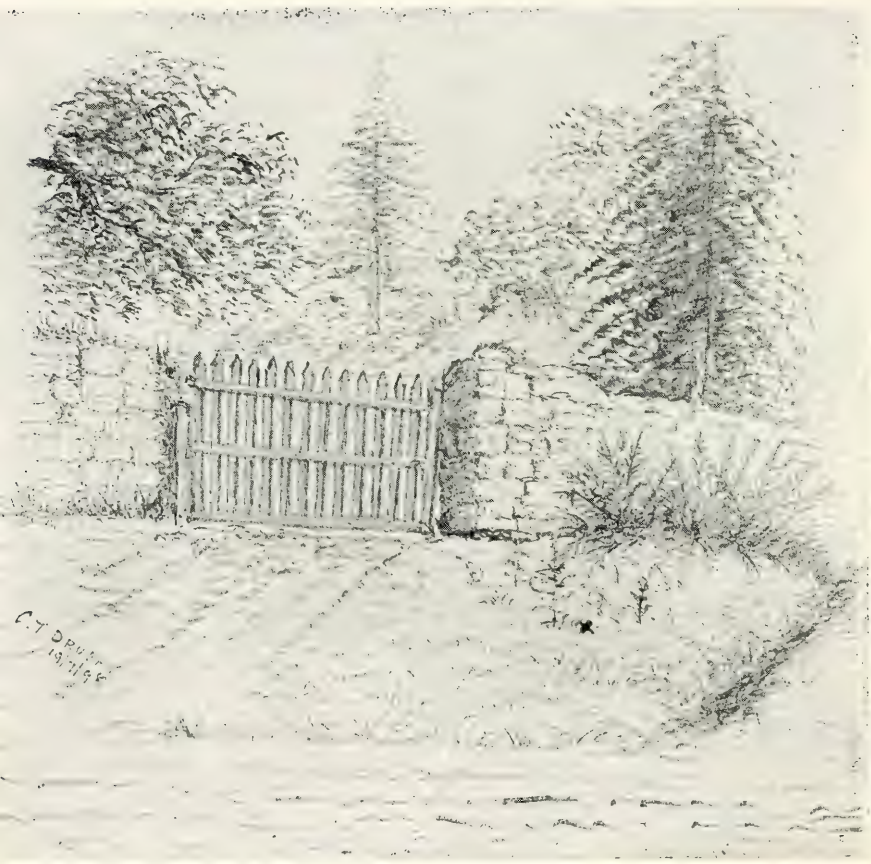


Fig. 5.

doubtedly constituting one of the most attractive features of the cult. The main type of variation consists in the formation of tassels at the tip of the fronds and subdivisions. Normally, each division has a central midrib or vein which terminates at a more or less pointed tip ; but in tasselled Ferns this midrib, which is really the feeder of its associated more or less

pointed leaf tissue, splits up into several divisions, and each division grows on and forms its lateral tissues, the result being a tasselled or crested tip. This tasselling or branching varies greatly in degree; it occasionally takes the form of an irregular simple forking of frond tips, or frond bases, so as to form twin fronds, and this may only characterise a few fronds of many on a plant, the rest being normal. For such the variety hunter has no wish; to be worth collecting, every frond must show the characteristic variation, and tasselling proper must be evidenced throughout. In the extreme types of cresting and branching combined, the specific characters may become so disguised that, as in the case of the dwarf Hartstongue (*Scolopendrium vulgare densum*, Kelway) and the Lady Fern (*A. F.-f. unco-glomeratum*), the frond of the one normally simple, green, and strap-shaped, and the other large, much divided, and feathery, both have become like balls of moss, and only the experts can determine the species at all. The great majority of our species have afforded crested sports, and sometimes on very different lines, since a crest may be a bunch of points, a fan, a repetition of divisions, or it may be stiff or pendulous, dense or lax, and so on, each form imparting a different aspect to the Fern. Furthermore, it may be associated with other characters, as we see above in the Victoria Fern, or the tasselling may extend to a greater or less degree to the subdivisions, the finest form of crested Lady Fern (*A. F.-f. superbum percristatum*, Druery), an example of selective results, having even the divisions of the fourth degree distinctly fan-tasselled. Scotland can boast of a pretty tasselled form of the Mountain Lady Fern (*P. Athyrium alpestre*), found by Mr Alexander Cowan, of Penicuik, a remarkable find, considering the limited and exalted habitat of the species. The crested Holly Fern (*Polystichum Lonchitis*) has been found several times. The next predominant type of variation is the plumose one, that is, an increase of leafiness or subdivision in the frond, accompanied usually by comparative or, it may be, entire barrenness as regards spores. The best of the plumose forms undoubtedly rank first among the beauties, the finest Shield Ferns rivalling and even eclipsing that antipodean gem, *Todea superba*, in delicate dissection; while in the opposite direction the "crispum" or frilled Hartstongues have no rivals on their

own lines as bold decorative undivided foliage plants. Fig. 6 shows how plumation alters the common Polypody of our hedges to a thing of infinitely greater beauty. Speaking of the Hartstongue, it is a pity that for the greater part of Scotland, except here and there on the south and west coasts, it is either rare or entirely absent, though when planted it seems to thrive

Fig 6.

well enough. The pity is the greater, as this simply constructed Fern, a mere simple, undivided, strap-fronded, smooth-edged type, has undoubtedly sported into more diverse forms than any other fern in the world. Every feature of it has varied in one or more ways. Old Gerard, in his "Herbal," depicts three varieties: a tasselled one, a sagittate one with harpoon-like fronds, and a form in which the barbs of this pseudo-weapon are slightly tasselled. Fig. 7 gives an idea from a nature-print of what nature can do with the Hartstongue, and fig. 8 an example on

different lines in the same species. Outside these two main types the diversity of detail and even of size defies description

Fig. 7.

in the brief space available; but we may say that it is the diversity of size, varying from huge fronds, four feet or more

long, to diminutive ones of fewer inches, little gems in thumb pots, and giants in tubs, which fits these varieties for large or small collections. Having now treated of the diversity available for rendering our hardy Fern collections not merely interesting but beautiful, we may advert to the fact that these varieties, springing as they have done directly or indirectly

Fig. 8.

from wild forms, are just as hardy and easy of culture as their progenitors. Unlike exotics, they need absolutely no warmth in winter, and indeed suffer from warmth in the long-run, since it tends to shorten their period of rest, to induce premature growth, and thus to weaken their vitality. The writer's collection, embracing several hundreds of varieties, is frozen hard every winter both under glass and in the open. Glass is therefore not essential to the life of the plants, but it is to the preservation of the beauty of the more delicate forms, by excluding wind, undiluted sunshine, and other damaging influences.

In pure country air the bulk of the varieties, given a little shade and shelter from wind, thrive in the open ; but near towns the evergreen species are apt to get their fronds blackened and perhaps poisoned by fog, and thus in process of time to become weakened and deteriorated, for although the worst treatment will not eliminate the full varietal capacity from the blood or sap, it is only under healthy and robust conditions that the full beauty and charm can be developed. Referring finally to selective culture, it is a remarkable fact that when the spores of well-marked wild "sports" are sown, they usually produce the type fairly truly, rarely reverting to the normal but varying only in grade. This variation in grade is of course the selector's opportunity, but it is a curious fact that absolutely our finest types of the plumose section of Polystichum and Athyrium have at one bound, as it were, given such advanced and highly developed progeny as would only normally be expected from many generations of selection. A merely decompound or tripinnate *P. angulare* yielded when first sown a whole batch of what are known as the Jones and Fox "plumosums," with dense moss-like fronds of exceeding beauty; the "superbum" Lady Fern section raised by the writer, acted in the same way, but on still more diversified lines; and, recently, *P. aculeatum*, the Hard Shield Fern, has given a batch of beautiful and graceful variants of an altogether unexpected type. Here, then, is another extremely interesting branch of the British Fern cult.

THE PLANTING AND AFTER-MANAGEMENT OF HARDY FRUIT TREES AND BUSHES.

By George P. Berry, Lecturer on Horticulture, Edinburgh and East of Scotland College of Agriculture.

Much has been written on the subject of hardy fruit culture, but a great deal of this is incorporated in large works on Horticulture, which are not readily available, and are, therefore, rarely consulted by those most interested in this important rural industry. In fact, one sometimes finds that the grower of fruit for market has not even had a practical training. It may be that the occupation has appealed to him as a congenial one, and that his knowledge of the art has been acquired by steady application and perseverance, and possibly also by the experience of a series of failures.

Aspect.—In selecting a suitable site for a plantation of hardy fruit trees, the question of aspect must receive consideration. An aspect facing due south, or, better still, one facing a little to the east of south, should be chosen. On such an aspect as the latter the rows of fruit trees and bushes can be planted so as to run S.S.E. and N.N.W., in which position they will receive the direct force of the sun's rays along the lines a little before noon-day, and will thus obtain the maximum amount of light and heat.

Shelter.—So far as I have been able to observe, the direction in which it is most essential to have shelter is on the east side of the plantation. This shelter may consist of trees, or it may be produced by the natural configuration of the ground; but whatever form the shelter may take, it is of great importance that the plantation be screened from the sun's rays for an hour or more in the early morning, as if this can be done much less damage will result to the blossom from late spring frosts than if the plantation were freely exposed on this side. As a hedge to form a wind-break, no better plant can be used than the "Myrobalan" or "Cherry-Plum" (*Prunus cerasifera*), good plants of which may be obtained at the rate of 4s. 6d. per 100 and

upwards, according to size. These should be planted not wider than 9 inches apart, but it will be better to plant them at 6 inches apart. The plants should be cut down to within 6 inches of the ground after planting, and they should be switched to an acute angle at the apex every season, the young growth being reduced by at least 18 inches. In heavy, well-manured ground I have produced round a fruit-tree plantation a hedge of this plant which was $7\frac{1}{2}$ feet high in five years from the time of planting.

Soil.—The best all-round soil for hardy fruit growing is a clayey loam overlying a pure clay subsoil, provided the latter is sufficiently well drained to prevent water becoming stagnant about the roots of the plants during winter. A fruit grower should test the drainage of his soil, and this he can do by making a few pits, say 18 inches deep by 1 foot square, and covering them over with boards. An occasional examination of these pits should be made during winter, and if water be found standing in them to within say 5 inches of the surface for any length of time, more efficient drainage will be necessary. If the ground is properly drained, the roots of fruit trees will withstand without injury the effects of much more severe frosts than we ever experience in Scotland; but if the drainage be defective, there may be much destruction of the tender rootlets.

Preparation of the Ground.—If the area be small, bastard-trenching of the ground is the best method of breaking it up. This consists in stirring the under spade-depth without removing it, and inverting the top spading upon it. If the ground is under pasture, the turf should be inverted over the bottom spading before the top spit of soil is turned over. In this way the ground is well worked, and the soil is left in its original position—that is, the top spit is still above and the under spit beneath. If the ground is under old pasture, the cost of doing this work thoroughly will be about £10 per acre. Where the area is large, the plough should be used, and the ordinary plough should be followed by the subsoil plough in order to stir the soil beneath to the depth of another 6 inches. Breaking up the soil by this method will cost little more than one-third of that by the former method; but spade-work, if well done, gives by far the most satisfactory results. At this stage of the operations the entire area to be planted should receive a

dressing of sulphate of iron, at the rate of 4 stones to the acre. This may be purchased at the rate of 1s. 6d. per stone, ground fine, and ready for application, and no other substance has such a marked effect in producing a rich colour in the fruit. A dressing of lime should also be applied, and if old lime mortar cannot be obtained, ground lime, which costs 1s. per cwt., should be applied at the rate of 8 cwts. per acre.

Planting.—In carrying out this important operation the fruit-grower should bear in mind that the most potent factor in fruit production is surface root-action. As soon as the feeding roots of a fruit tree have got out of touch with the surface soil, indifferent results follow. Either a rampant growth of vegetative shoots is produced, or the plants may begin to show signs of premature decay or of attack by fungus disease. The effect of the exclusion of air from the roots of fruit trees is to prevent them from obtaining from the soil the phosphate and potash which are essential for fruit production, for where there are no roots near the surface of the soil nothing but pure water is taken up by the plant, with the result that there is excessive production of vegetative growth at the expense of fruit buds, and no amount of winter pruning of the shoots will remedy this state of affairs. The importance, then, of avoiding a deep root-action is quite obvious, and shallow planting must be resorted to.

The best time for planting is November. Autumn root-action has not then come to a standstill, and if planted then, deciduous trees and bushes of all kinds make a better start into growth in spring than if planted during the dead months of winter, or even in early spring. The soil has not then lost all its summer heat, and the plants establish themselves better than if planted later.

In planting, the following procedure should be followed:—A circular pit, somewhat larger in diameter than the spread of the roots of the tree or bush, should be formed. No matter how deep and suitable the soil may be, the pit should never be made more than 6 inches deep. On a shallow soil 3 inches deep will be sufficient, and on some light soils, on gravelly subsoils, the plants should be placed practically at the surface. The bottom of the pit should be perfectly flat, and a strong stake should be driven in the centre as a support to the plant. This is very important, for should the tree be swayed

by the wind during the first season after planting, the small fibrous roots and root-hairs will be snapped off as they are formed. After trimming the extremities of all damaged roots with a sharp knife, and moistening the roots with water, if they are dry, the plant should be placed on the S.W. side of the stake, and the roots should be carefully spread out on all sides. The roots should first be covered with some of the finer soil, say

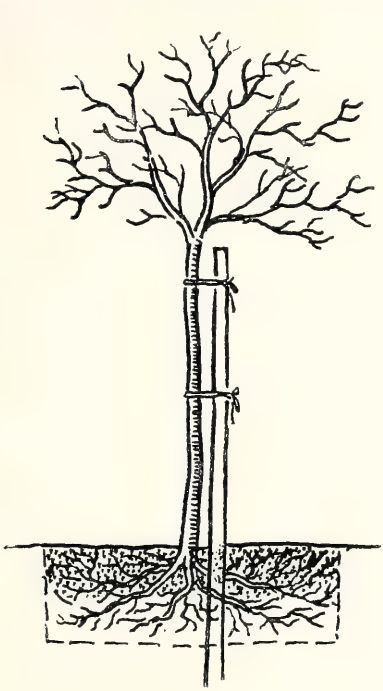


Fig. 1.

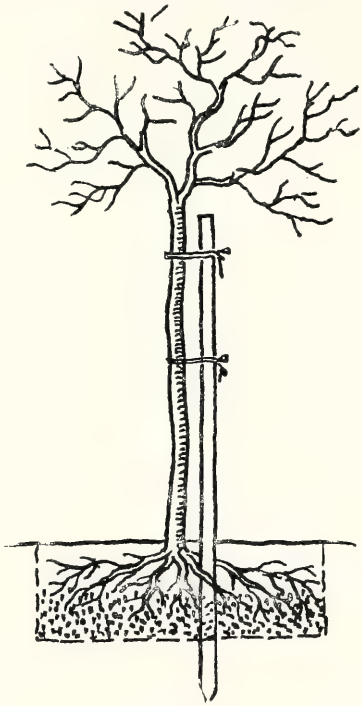


Fig. 1*a*.

1 inch deep, and this should be made fairly firm with the foot, and worked into all the cavities about the base of the plant. This first covering of soil should be applied with the spade, beginning at the stem of the plant and working towards the circumference of the pit, so as to avoid crumpling of the roots. Some good cow manure and a spadeful or two of old lime mortar should be mixed with the soil taken out of the pit, and with this the pit should be filled up to the surface level (see fig. 1). By

planting in this way a surface root-action is induced, and by the end of the second year practically all the feeding roots will be at the surface of the ground, and they must be kept there, lying below the mulch, so to speak, like a net. On no account should they be induced to seek a downward direction by placing the feeding material underneath the root of the plant, as in fig. 1*a*. By adopting the method of planting which has been described, and if he has been happy in his selection of varieties, the fruit-grower will invariably get a crop, unless climatic conditions are very much against him.

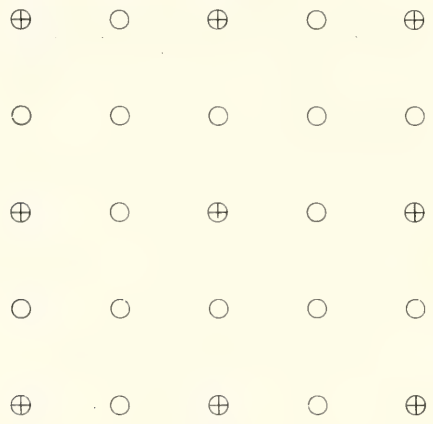


Fig. 2.

⊕ Bush or Pyramid Apples on *Crab* stock, or Plums.
O Bush Apples on *Paradise* stock.

The plant should be fastened to its support by first placing a band of corduroy round its stem, and tying it to the post with a piece of Helvetia belt-lacing, which should be crossed between the stem of the plant and the post, and tied at the back of the latter.

The kind of Trees or Bushes to Plant.—With regard to the kind of plants to use, I would recommend bush or pyramid Apples and Plums. In the case of Apples, a certain number of bush or pyramid plants on the *Crab* stock should be planted at 15 feet apart, with bush plants on the *Paradise* stock planted between these, making the common distance between the plants $7\frac{1}{2}$ feet, as in fig. 2; or bush or pyramid plants on the Crab stock, or Plums may be planted at 15 feet apart with two

rows of small fruits, such as Gooseberries or Currants, planted between them, making the common distance between the plants 5 feet, as in fig. 3.

In the arrangement shown in fig. 2, a single line of Cabbages or Potatoes may be planted between the fruit-trees.

Manuring.—If fruit production is to be maintained, surface root-action must be encouraged, and this can only be done by the application of feeding material at the surface of the ground. In Scotland, fruit crops will generally pay for an application of good cow manure, at the rate of 10 to 12 tons per acre, a very

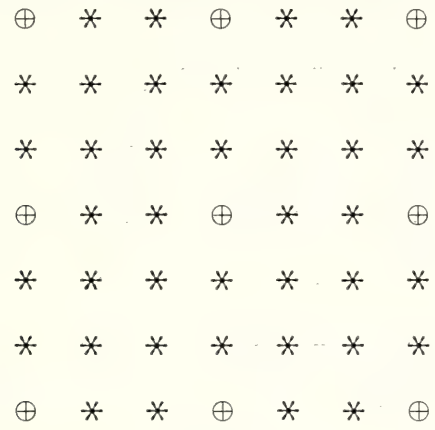


Fig. 3.

⊕ Bush or Pyramid Apples on *Crab* stock, or Plums.
✻ Small Fruits, such as Gooseberries or Currants.

ordinary farmer's dressing. A plantation of Apples and small fruits takes just as much feeding material from the soil yearly as does a well-grown Cabbage crop, although the ingredients extracted are not in the same proportion in both cases. Generally speaking, the three most important ingredients which it is necessary to have present in the soil in fruit-growing are (1) lime, (2) phosphate, and (3) potash. Analyses of our richest soils show that these three substances are present in about the following proportions :—

Lime	1·37 per cent.
Phosphate . . .	0·87 ,,
Potash	0·47 ,,

Now, if the ash of well-grown apples, *i.e.* after the water has been driven off, be analysed, it will be found that it contains these ingredients in about the following proportions:—

Lime	5·66 per cent.
Phosphate . . .	8·26 „
Potash	56·74 „

Considering, then, the small percentage of these all-important substances which occur naturally in the soil (and they may not always be in a form which is available to the plant, owing to insolubility) as compared with the high percentage contained in the fruit, it is impossible to conceive of fruit trees of any kind being able to give remunerative returns, unless these three substances are kept dominant in the soil; and it will generally be found that in the case of old orchards, where trees may have been growing for many years without receiving any feeding material, all the available phosphate and potash have been used up, and that the starved trees are dragging out a miserable existence.

The best time to apply cow manure as a surface dressing to fruit trees and bushes is from the beginning of October to the middle of November. Root-action is then vigorous, and the trees and bushes are enabled to lay up a good store of elaborated material behind the flower-buds. This means much, for upon it depends the production of strong, vigorous blossom in spring. In many instances starved trees produce abundant blossom, but of such a weak constitution that it rarely sets fruit, even under very favourable climatic conditions. In spring, fruit trees have to carry on growth, burst their buds, and set their fruit before they have a crop of leaves to enable them to manufacture the material taken up by the roots, and all this has to be done by means of the reserve material stored up in the previous season. Hence the importance of making certain that feeding material is available as the plants go to rest in autumn.

Every fruit grower is familiar with the beneficial effects of liquid manure. This may be ordinary liquid manure from cow sheds, diluted with three times its bulk of water, or it may be any of the following:—

(1) 1 peck of sheep manure in 40 gallons of water.

(2) 1 peck of poultry manure in 40 gallons of water (makes a very serviceable liquid manure).

(3) ½ lb. sulphate of ammonia and 1 lb. sulphate of potash in 40 gallons of water.

The best time to apply liquid manure is during the "swelling" period—that is, from the time the fruit begins to swell to the time it is fully ripe.

Thinning of the Fruit.—If young trees are to be kept in a fruit-bearing condition—that is, in such a state that they will yield an average crop of fruit every season—judicious thinning of the fruit must be resorted to. If, in the case of young apples, the fruits be reduced to one to each spur, with intervals of 6 to 7 inches between the fruits, a greater weight of fruit will be produced, and of a quality which will command a higher price on the market, than if all, or the majority, of those which have set are allowed to come to maturity, while the constitution of the trees will not be unduly strained and their vigour impaired. The grower must remember, however, that it is not the production of fruit, or the part which is eaten as fruit, which puts such a severe strain upon the plant. It is the production of seed which taxes the energy of the plant, and where the amount of seed can be reduced by thinning the fruit, all the energy thus saved is directed into the remaining fruit, which in the gross weighs more than if the total set had been allowed to come to maturity. In the case of Victoria Plums, for example, when the crop is heavy, one-half of the fruit may be removed when they are as large as pigeon's eggs, and bottled for use in tart-making. The remaining half, if allowed to come to maturity, will, of course, consist of larger fruits, which will bring a relatively higher price, a result produced by diverting the energy which would have been used up in the production of a large quantity of seed into a more profitable channel.

Pruning at the Time of Planting.—In the case of fruit trees which have been transplanted in the nursery the year previous to planting out in their permanent situations, little pruning is, as a rule, necessary. It often happens, however, that trees are sent out from the nurseries with from 18 inches to 2 feet of the current year's growth, while, in all probability, owing to careless lifting, they may have not more than a third of the previous year's roots. Now, to plant trees or bushes in this condition unpruned would inevitably result in very weak growth the first season. But this is not the only bad effect which such pro-

cedure would have, for all the next season's growth would be produced towards the extremities of the shoots, while a number of the buds on the lower part of each shoot would fail to move, and would gradually disappear, leaving a long, lanky growth partially devoid of fruit spurs. The best practice, therefore,

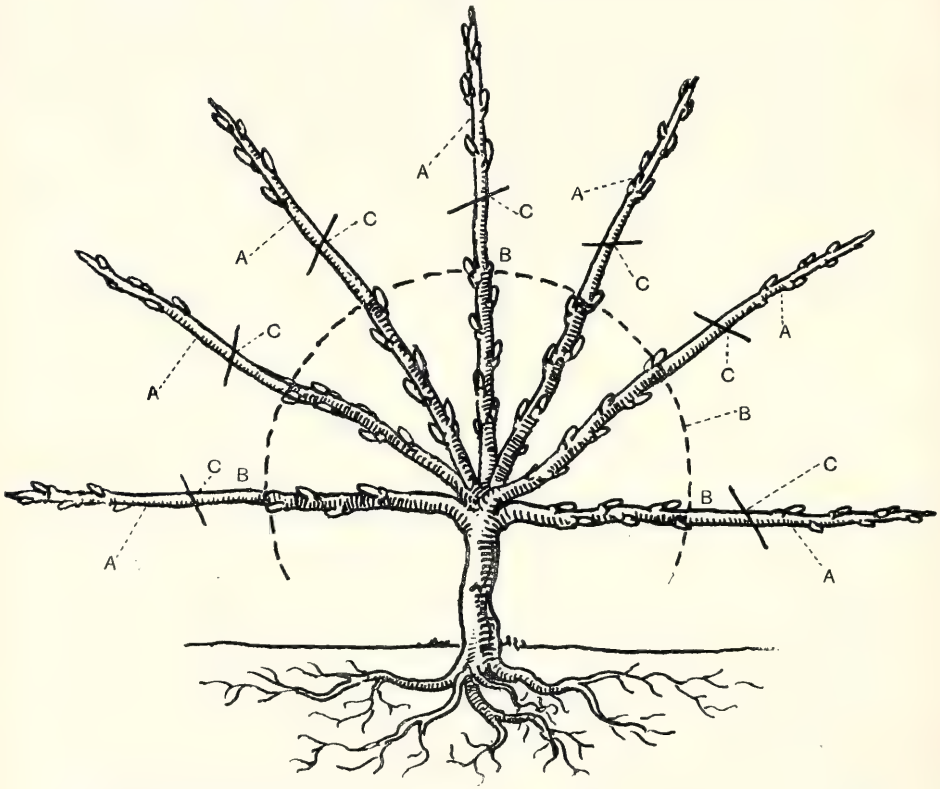


Fig. 4.—Wall-trained tree at end of growing season. A A, current year's growth; B B, limit of previous year's growth (or points at which the shoots were pruned); C C, points at which the current year's growth should be removed.

is to remove about two-thirds of the previous season's growth about six weeks after planting (see fig. 4). This ensures a strong start into growth in spring, and it results in the bush or tree being furnished with fruit spurs from the foundation. Neglect of pruning after planting may frequently be seen in the case of wall trees, a blank space being often produced

towards the centre of the tree, and this can never be furnished with fruiting spurs, save at a great sacrifice (see fig. 4).

Selection of Varieties.—The following list is compiled from results which I have obtained on a variety of soils in the northern counties of England, where in some instances the climate is inferior to that of many parts of Scotland. The plantations were laid down in situations varying in altitude from 50 feet to slightly over 1000 feet above sea-level.

Culinary Apples.

Lane's Prince Albert.
Ecklinville Seedling.
Bramley's Seedling.
Warner's King.
Bismarck.
Belle de Pontoise (for high situations).
Cox's Pomona.
Domino.
Golden Spire.
Grenadier.
Hambling's Seedling.
Hawthornden (old).
Lady Henniker.
Liddell's Seedling (for high situations).
Lord Derby.
Lord Grosvenor.
Maltster.
Lowther Castle.
Newton Wonder.
Norfolk Beefing.
Pott's Seedling.
Stirling Castle (always on the Crab).
The Queen (Saltmarshes).
Tower of Glamis.
Blenheim Orange.
Kentish Fillbasket.
Royal Jubilee (Graham's).
Duchess.
Barnach Beauty.
Yorkshire Beauty.

Dessert.

Irish Peach.
Juneating.
Mr Gladstone.
Worcester Pearmain.
King of the Pippins.
Court Pendu Plat.
James Grieve.
Duchess of Oldenburg.

Pears.

Hazel or Hessle.
Jargonelle.
Williams' Bon Chretien.

Plums.

Victoria.
Prince of Wales.
River's Czar.
Early Rivers.

Cherries.

Governor Wood.

General Pruning. — To describe summer pruning, winter pruning, and root pruning in detail would lengthen this paper abnormally. Suffice it to say that, in the open, pruning or checking of the young growth about 10th August tends to swell the fruit and mature the basal portion of the shoots for the coming season. This applies to all districts north of Mid-Yorkshire, but south of this line the operation can be performed twice during the season of growth.

Winter Pruning. — Slightly thinning and shortening the shoots, so as to admit light and air, and to promote growth during the resting season, is an advantage.

Root Pruning.—If trees are being fed, and surface root-action is being maintained, no root pruning will be necessary. Surface root-action and judicious manuring are of more importance than root pruning, although the latter is also sometimes beneficial; but many fruit growers for market who neglect root pruning might with advantage give more attention to planting and feeding than they do as a rule.

Insect Pests.—The most obnoxious trio we have to deal with in this country, so far as the Apple, Pear and Plum are concerned, are the winter, codlin, and March moths. Banding the trees in early October, or, better still, in the end of September, prevents many of these insects from depositing eggs. A band of grease-proof paper is placed round the stem, 6 inches or more above the ground. The outside of the paper is coated with a mixture of resin, sweet oil, and a little sulphur. The resin is melted in an old pot, and the materials are mixed to the consistency of thick treacle, and applied with a brush. In spring, when the buds are bursting and before the blossom fully opens, arsenate of lead should be applied as a spray in the proportions of 1 lb. to 17 gallons of water. This should be applied by means of a spraying syringe. For wall trees and espaliers, and also for bush and pyramid trees, as a winter wash to destroy larvæ and eggs, the following mixture may be used :—

½ lb. caustic soda . . .	In 5 gallons of water.
2 oz. black treacle . .	

This should be applied in winter with an ordinary syringe. This caustic alkaline wash is also most effective against the

Mussel Scale, now so common, and it is also excellent for removing moss or algæ from trees and bushes. It never harms the buds if applied during the resting season.

Apple Canker.—Little can be done for this fungus disease when once it is firmly established. Scraping out the cancerous wounds with a piece of stick, and then filling up the hole with gas tar, so as to aid in the formation of fresh bark, and lifting trees which may have been too deeply planted, may be tried. There can be little doubt, however, that shallow planting enables susceptible varieties to resist the disease to some extent.

THE DAHLIA.

By Robert Fife, Rothesay.

The Dahlia—that remarkable and handsome autumn-blooming plant of our gardens—has had a somewhat eventful career. Born, so to speak, in Mexico or Central America, it had doubtless bloomed unheeded for centuries on the high-level plains of that remote region. The native name of the plant was Acocotli, and great medicinal virtues were attributed to it.

The Dahlia was observed for the first time by a European, a Spanish traveller, about 1640, but he did not live to introduce it to the Old World. About 150 years later (or, to be more exact, in 1789) seeds were forwarded from Mexico to the Royal Gardens at Madrid. These seeds produced in 1790 what were then supposed to be three distinct species, namely, *Dahlia pinnata*, *D. rosea*, and *D. coccinea*. The Marchioness of Bute, wife of the then Ambassador to the Spanish Court, procured a few seeds, and forwarded them to England, where they produced plants which bloomed, but were afterwards lost. It would seem that from Madrid seeds found their way to many Botanic Gardens in Europe, and in 1802 we find an English nurseryman, J. Fraser, procuring seeds of *Dahlia coccinea* from Paris. The produce of these seeds bloomed in the following year, and, according to the late Mr Shirley Hibberd, "the flowers formed the subject of a plate in the Botanical Magazine, which secured to the plant a proper place in the English garden."

In the year 1804 Lady Holland sent seeds from Madrid, it is generally believed, to Holland House, Kensington, where they were successfully cultivated and much admired by the Lord Holland of that day. It is surmised that these were again lost, and general interest in the Dahlia, so far as this country was concerned, seemed to be on the wane until 1815, when a further stock was introduced from France. By this date semi-double flowers were not uncommon. From this point, the march of progress is both rapid and successful.

Perhaps the first recorded mention of the Dahlia in Scotland is to be found in the Minutes of the Royal Caledonian Horticultural Society, as under:—

"HALL OF THE ROYAL COLLEGE OF PHYSICIANS,
"EDINBURGH, *8th September* 1818.

"Sir George Mackenzie, Bart., stated that a basket containing a beautiful display of Dahlias had been exhibited by Mr M'Nab, of the Royal Botanic Garden, who had first introduced their culture in the open air at Edinburgh, and that another and still more varied and brilliant assortment of the flowers of that very ornamental plant (60 varieties) had been presented by Messrs Charles and John Peacock, nurserymen at Stanwell Lodge near Edinburgh. Upon a motion to that purpose, a medal was awarded to Mr M'Nab, and another to Messrs Peacock."

"HALL OF THE ROYAL COLLEGE OF PHYSICIANS,
"THURSDAY, *2nd September* 1819.

"The same cultivators (*i.e.* Messrs Peacock of Stanwell Lodge) exhibited two baskets of Dahlias, containing above 300 varieties of that splendid flower."

"COUNCIL AND COMMITTEE MEETING,
"EXPERIMENTAL GARDEN,
"EDINBURGH, *7th August* 1828.

"A box from Delvine was opened containing a rich display of seedling Dahlias and of seedling Carnations. . . . Cordial thanks were awarded to Mr William Henderson, gardener to Sir Alexander Muir Mackenzie, Bart., for these communications."

From the foregoing extracts it will be observed that the florists of Edinburgh took a great interest in the cultivation of the Dahlia, and—although there does not seem to be any direct proof—it might not be unreasonable to suppose that the Scottish florists were, up to 1820, ahead of their English brethren, both in quality of flowers and continuity of culture.

In those early years of the cultivated Dahlia, single flowers were not generally appreciated, and everything points to the desire for a perfect symmetrical flower, such as was almost

exclusively seen before the introduction of the charming cactus-flowered varieties with which we are at this date familiar. Before me as I write is the Dahlia Register for 1836, containing coloured plates of the novelties of the year, which, in respect of number, form, and especially of colouring, are not to be despised. It is well-nigh impossible to believe that such results could be obtained in a period of from twenty to twenty-five years; but the Begonia and Sweet Pea of our own day are in themselves notable examples of perseverance with a definite end in view. At this date, 1836, Mr J. Mantell, F.L.S., informs us that "it is computed that not less than twenty thousand seedling Dahlias are raised annually in this country."

A peep at the Trade Catalogues of Dahlias for the year 1836 is of extraordinary interest, in view of the fact that double or semi-double Dahlias had only been known for a period of twenty years, and also in the light of our present-day collections of these flowers. Mr George Glenny, of Isleworth, Middlesex, offers fifty new varieties, with "faithful descriptions," and "selected from 3000 plants"; Messrs J. & R. Cove, Millfird, near Salisbury, offer twelve novelties selected from 4000 plants; Mr B. Saunders, of Jersey, has a list of 132 varieties; Mr James Levick, of Sheffield, one of 187; but Mr H. Skillman, of Marlborough, Wilts, tops the list with a collection of no less than 245 named varieties. Other noted growers of the time were Messrs E. Bartlett, Bath; J. Bates, Oxford; T. & E. Brown, Slough; J. Harris, Dorset; and W. Heale & Sons, Calne, Wilts. The prices in the above growers' catalogues range from 1s. to 10s. 6d. each, the average being about 2s. 6d. per plant. It may readily be conjectured that, owing to rapid improvement, the same Dahlias did not long hold the field, although classes for Dahlias in 100 distinct varieties, provided at some of the principal exhibitions, would somewhat modify the process of discarding. The only variety mentioned in the lists of 1836, and still grown during the closing years of the century, was "Picta formosissima," a variety now probably extinct.

The Development of the Dahlia.

The development of the Dahlia calls for some attention. It has already been noted that many of the first arrivals in Double Dahlias must have been of fleeting duration. Raisers, no doubt,

laid hands on anything of a double nature, and these were rapidly superseded year by year, until a somewhat creditable standard of merit was attained. From illustrations now before me, and from personal experience, it is evident that, comparatively speaking, little improvement was made in the Show and Fancy Dahlias during the latter part of the nineteenth century, they having, like the Stage Carnation, reached a point of per-

Cactus-flowered Dahlia.

fection beyond which nature seems disinclined to move. Some of the best Show and Fancy Dahlias of the present time are at least twenty-five years old.

A new outlet for the energies of the hybridist and selector was, however, furnished by the introduction into Europe of the Cactus-formed Dahlia, afterwards known by the name *Dahlia juarezii*. This remarkable newcomer was the only one saved from a consignment of roots sent from Mexico in 1872 to a grower near Utrecht, in Holland. Passing into the hands of a

prominent Dutch firm, it found its way to London through the agency of Mr W. H. Cullingford, and finally was secured by Mr Henry Cannell, of Swanley, by whom it was first exhibited in 1880. The possibilities of the new race, so aptly named "Cactus," gave an unbounded impetus to the raising of Dahlias having more or less of a cactus form. Rome, we are told, was not built

Pompon Dahlia.

in a day ; neither were the exquisite forms of to-day produced in one season ; but they are the memorials of intelligent, persevering labour. The Cactus-flowered Dahlia, as we know it, is, like its near relation, the "Show" variety, rapidly approaching a point where further improvement will be at least a matter of greater difficulty than hitherto.

The Pompon Dahlia is supposed to be of German origin, the

progenitor being a seedling from *Dahlia coccinea*. I have consulted many old records, but I can find no trace of the Pompon Dahlia until the latter half of last century. Notwithstanding its lack of history, this Dahlia has become an indispensable feature of our gardens, and such improvements have been effected during the last decade that plants are not only profusely adorned

Decorative Dahlia.

with charmingly perfect flowers, but they are also dwarf and compact in habit.

Just as the Pompon Dahlia is the miniature counterpart of the old-fashioned show section, so, in like manner, is being developed the class now known as Pompon Cactus, a duplicate in everything but size of the widely appreciated descendants of *D. juarezii*. It is not too much to expect that in the near future

the Pompon Cactus Dahlia will excel all others for table and other light decorations.

The so-called Decorative Dahlias came into prominence with the development of the "Cactus" division, and were for the most part inferior varieties of the show section, with the property of producing large, showy, flat flowers profusely and well above the foliage. If any of the originals are now grown, it must be out of curiosity, or for the purpose of comparison,

Single Dahlia.

because many of the more recent "Cactus" introductions are not only fine in the flower itself, but also most valuable from a decorative point of view.

The thirst for something new was not quite satisfied with the introduction and improvement of the Cactus Dahlia. The old single *Dahlia coccinea*, mentioned eighty years previously, was re-introduced to the public in 1880, and along with it came *Dahlia lutea*, and a beautiful-edged variety named "Paragon." These single forms took the public by storm, and only those

who have seen the vast numbers grown and raised by Messrs Lamont, of Musselburgh, and other great British growers, can have any idea of the extent of the popular demand at the time. A few years sufficed to bring this section to a high standard of excellence, but alongside was being developed the cactus-flowered varieties, with the result that taste was diverted to other channels, and to-day the Cactus Dahlias are prime favourites, with the Single but little in evidence.

The Single Cactus Dahlia—a type quite distinct from the foregoing, with long, pointed, and somewhat incurving florets

Single Cactus Dahlia.

—was raised by the late Mr E. J. Lowe, F.R.S., of Chepstow, and placed on the market in 1893 by Messrs Dobbie & Co., of Rothesay. For light table decoration it is exceedingly effective. The parent of this section was a single Dahlia, "Stella bianca," crossed by pollen of *D. merckii*.

Still they come! Collarette and other fantastical forms of the Dahlia have been introduced from the Continent, but their presence here has not yet set the Scottish heather on fire. The near future may, however, see a movement in this direction.

Tom Thumb Single Dahlias were introduced to the public notice by the late Mr T. W. Girdlestone, of Sunningdale, for

many years Secretary and, latterly, President of the National Dahlia Society. Although they are admirably suited for certain designs in bedding, yet they have not engaged the public attention to any marked degree. The plants range in height from 12 to 15 inches, with flowers about 6 inches higher.

A more notable contribution to the already varied Dahlia classes came from Holland in 1906 in the shape of the Pæony-flowered Dahlia. This section is of vigorous growth, with very

Collarette Dahlia.

large semi-double flowers in greatest profusion, and it promises to be of value in large designs or borders.

The Star Dahlias, introduced in 1907 by Messrs Dobbie & Co., of Rothesay, are quite distinct from all others now grown, and produce semi-double flowers of twisting and fantastic form, with long, curving, and striped florets. A special feature of this section is its comparatively dwarf habit and extreme freedom of flowering.

It is impossible here to give the names of those who in past years have contributed to the development of the Dahlia, but the best known names of the last twenty years may be summed

up as follows: Burrell, of Cambridge; Cannell, of Swanley; Cheal, of Crawley; Dobbie, of Rothesay; Girdlestone, of Sunningdale (private); Humphries, of Chippenham; Keynes, of Salisbury; Lamont, of Musselburgh; Mortimer, of Farnham; Seale, of Sevenoaks; Shoesmith, of Woking; Stredwick, of

Pæony-flowered Dahlia.

St Leonards; Turner, of Slough; Walker, of Thames; Ware, of Tottenham; and West, of Brentwood.

The Properties of the Dahlia.

The early cultivators of the Dahlia laid down definite rules as to what properties the flower ought to possess, and their ons do not materially differ from the opinions of the

present day. For example, in the *Floricultural Cabinet* for June 1834 the following paragraph occurs:—

"*Dahlias.*—A fine flower should be of perfectly circular form, the outer petals stiff, well rounded and cupped, not too much, so as to present a quilled appearance, and well filled up

Star Dahlia.

to the centre—not in the least degree showing the eye—neither should the eye be at all sunk or flattened, but rather elevated above the other parts when in full bloom—the whole flower presenting a true circle when viewed above, but of a hemispherical form when observed at the side. Those flowers possessing two colours, to have them clear and distinct."

Form, colour, and size were in 1834 considered to be the

essential properties of a good Dahlia, and no one will venture even now to call that decision in question. In judging, form seems to have been awarded three points, colour two, and one point was allocated to size. This is a very safe rule, although in these days size occasionally carries greater proportionate weight than is given above.

Show Dahlia.

The *Horticultural Journal* for 1835, page 15, says:—

"The flower which seems now the most important, and about which, so far as good properties are concerned, least is known, or rather least is published, is the Dahlia; and it is one in which the leading general properties to constitute perfection must be very few, because the great variety of style, shape, and colour belongs to detail and not to general properties."

By the way, it may be noted that at this time (1835) in all probability *Dahlia juarezii* was blooming unadmired in its native land, and no one had ever thought of such a development as we have in the Cactus Dahlia of our own day.

The same general rule in judging holds good, whether Show, Fancy, Cactus or Single Dahlias are being dealt with, but, while in Pompon form and colour are most essential, largeness is a disqualification.

The Cultivation of the Dahlia.

An ideal spot for the cultivation of the Dahlia is one lying well to the south—if gently sloping all the better—where the soil is a well-drained, well-manured, heavy loam. If these latter conditions do not exist naturally, let them be artificially arranged for as nearly as possible, because nothing conduces more to the production of dwarf sturdy plants and large fine flowers than a strong loam. Shelter from high winds, and especially north or easterly gales, must be in existence or provided. An abundant water-supply, in the event of very dry weather, can hardly be too close at hand. Deep cultivation of the soil is of course advisable, and bastard trenching is one of the best methods of procedure. Good results are often obtained by spring digging, but where possible the land should be prepared in autumn, and again thoroughly worked in spring. The requirements of the grower will to some extent decide the methods of manuring, but it may be here observed that over-manuring of Dahlia land is not an everyday occurrence.

The beginner will, of course, procure his plants from a reliable nursery, where an up-to-date collection is kept, about the middle of April, or any time up till the first week in June—the earlier the better, if good results are to be expected. On receipt of the plants by parcel post, they should at once be placed in 3-inch pots and transferred to a gentle bottom heat for about two weeks. At the end of this period the plants should be placed in 5 or 6-inch pots, using a good rich compost, and replaced for a week or two in moderate bottom heat, with abundance of air to keep the growth strong and short-jointed. Careful attention to watering, airing, and protection from frost will occupy the grower's mind until the first week in June, before which, in Scotland at least, it is not safe to plant out Dahlias.

Dahlias may be planted in the way most convenient to the grower ; but a space of 4 feet between the plants—when set out in a block or line—is a fair average distance. Many successful cultivators plant much closer than this. Whatever the distance or arrangement may be, it is well to have the stakes in their places previous to planting, thus avoiding any chance of injury to the roots, while the plants, if well grown, will require support at once. As a rule it is advisable to manure the plants individually, rather than collectively, and by this method there is no waste of manure. Make a hole, 15 to 18 inches wide and 12 inches deep, close by each stake, and fill the same with a good rich prepared compost. Turn the Dahlia out of the pot and plant amongst the compost on the side nearest the stake, press the soil firmly around the root, and tie the stem to the support. Frosty nights in June are not uncommon, and a sharp lookout for such must be kept.

With the advent of warmer weather, slugs and insect pests may prove troublesome. Lettuce leaves scattered amongst the plants, or a few seeds of the same sown on the beds, will afford sufficient feeding for the slugs and great protection to the plants at the same time. Greenfly and thrips may be kept under control by a judicious use of insecticides and frequent syringing with clean water; but no insecticides should be used when plants are in flower, or blooms may be spoiled. Earwigs often prove troublesome during the flowering period, but they may be trapped by placing small pots, containing a little paper or moss, on the top of the stakes or amongst the branches. The pots should be gone over daily, and the insects removed. A tuft of cotton-wool tied round the flower stem with fringe downwards is also a preventative.

Early in July the plants will have made good growth, and constant attention should be given to thinning, staking side shoots, and tying. Show and Fancy Dahlias are best trained to a centre stem, with four of the strongest side-shoots left. Cactus Dahlias may have more branches retained, but all depends on the size of the flowers required and the purpose for which the plants are grown. By judicious manipulation of the remaining shoots, flowers can at all times be had in readiness for exhibiting after the blooming period has set in. Those who wish to grow for garden decoration only, will stake and tie, but need

not thin out or disbud freely. Pompon Dahlias are all the finer when blooms are small and neat, and these should not be thinned out or very strongly grown. Single Dahlias of all sorts are mainly used for garden decoration, and on this account can hardly have too many shoots; but, if fine exhibition blooms are wanted, recourse may be had to moderate thinning or disbudding.

With the continued growth of the plants, and especially if for exhibition purposes, judicious feeding will be necessary. A heavy mulching of half-decayed stable manure will prove of immense value, and an occasional dressing with a good artificial manure will considerably increase the size and texture of the flowers. Copious watering in dry weather must not be neglected. A season of anxious care and earnest labour deserves to be rewarded by a gay garden or first-class exhibition honours, but "there's many a slip 'twixt the cup and the lip," and ofttimes grievous disappointment ensues. Rain, hail, and wind occasionally leave sad tales behind them, while earwigs and small slugs may disfigure the more promising blooms—all showing the necessity for unremitting care and attention.

In our variable climate it is well to be prepared for emergencies, and to have at hand shading and protecting materials. Boxes, with glass tops, attached to a stake are most useful, and in like manner "Acme" protectors may be named. Even a piece of flat board nailed to the top of a stake serves the purpose of protection. In all cases the flower stem should be secured to prevent movement and consequent rubbing.

When required for exhibition the flowers should be cut late at night or early in the morning. Show, Fancy, and Cactus sorts too, are staged on the orthodox flat boards, this arrangement providing for the larger blooms in the back row on the stand, the rest diminishing gradually in size towards the front. Careful staging and harmony of colour often gain points in close competition, while attractiveness is added to an exhibit when it is neatly named. Cactus Dahlias attain their proper place when exhibited in jars or glasses with suitable foliage. For this purpose long stems are essential, and wiring is also necessary to get the best effects. All classes are suitable for this treatment; even medium-sized flowers of the Show and Fancy section do not look amiss.

From the middle of September onwards, no collection of

Dahlias is safe from frost, and unfortunately a glorious display of Dahlias in the garden may have its career cut short. Granted that the inevitable has come to pass, and the plants stand as blackened weeds, choose a fine dry day, and, after cutting the stems a few inches above the roots, proceed to carefully lift the same, remove the soil as far as possible, and lay in the sun or in

The "Acme" Protector.

an open shed to dry. Labels will, of course, have been secured, fixed to the roots by wire or tarred twine. It is advisable to turn the stem downwards, to permit of the escape of any moisture likely to inaugurate a process of decay. When sufficiently dried, the roots may be removed to winter quarters —any place at once cool and dry, but free from frost. Some growers cover their roots with dry earth or sand—and this is a

capital idea where the roots are more fibrous than tuberous—but I have found that roots laid on a bench or staging without any covering material have given excellent results. The

A Dahlia cutting as taken from the plant. It is trimmed off at the dotted line.

The same cutting prepared for insertion.

adoption of this method permits of an easy examination of the roots, and lessens the chances of loss. If perchance a root is threatened with decay, the defective portion must be removed, and the remainder dusted with lime. This attention may not only save the root, but prevent damage to others close by.

The middle of February will be quite early enough to take Dahlia roots from their winter quarters, at which time the roots should be neatly trimmed and placed in boxes or on a warm bench in a glass house. The roots will of course be arranged crown upwards, and should be covered to two-thirds of their depth, the crown being left bare. In two or three weeks' time young growths will make their appearance, and these, if very strong and sappy, had better be thrown away as useless. Wiry growths about 3 inches in length make most suitable cuttings, and may be taken off with a "heel" if preferred. After careful dressing, and the removal of the lower leaves, the cuttings may be inserted in pots or boxes filled with somewhat sandy soil and placed on bottom heat of, say, 70°, where they will root in from fourteen to twenty days. If only a few plants are required, the roots may be put to work somewhat later and broken up, retaining to each shoot a piece of the tuber.

These roots may be potted up at once into 5 or 6-inch pots, but the plants from cuttings will, when rooted, take 2½-inch size to begin with, shifting into larger sizes as required.

Such is a brief outline of the Dahlia, its history and culture, which I hope may be of some interest. Growers differ in their methods to attain the same ends, and some good may be found in every system. The Dahlia has attained to a great eminence in the horticultural world, from which it cannot easily be dislodged, and my impression is that we are on the threshold of another great movement or "break" which will have a far-reaching course. The present classes are nearing their limit of perfection, and may in the near future have, like the Stage Carnation, Primula, Cineraria, Begonia, and the superb Rose, to give place to scalloped or frilled edges, more plentiful if not so perfect flowers, or some other undeveloped property quite apart from the ideas and aims of the good old florists of the years gone by.

THE AURICULA, SHOW AND ALPINE.

By James Douglas, Edenside, Great Bookham.

It is just fifty-five years since I first became acquainted with the Auricula. Six plants of show varieties were exhibited in the Town Hall at Kelso, in Roxburghshire, by the late Mr James Tait, of Edenside. These six plants made me an Auricula fancier, and I now grow 15,000 or more.

The show Auricula has a history, owing some of its popularity to the author and botanist Clusius, a Belgian, who was invited by the Emperor Maximilian II. of Austria to take charge of his garden in Vienna. Clusius collected in the Styrian Alps many species of Primula. In 1601 he published an excellent book on botany, "Rariorum Plantarum Historia," and he therein bitterly bewails the difficulty he had in "taming" those alpine Primulas. He managed to bring into subjection two species, viz. *Primula Auricula* and *P. pubescens*. Probably others besides Clusius had brought these two species under cultivation, as different varieties of Auricula were in cultivation in Belgium, Germany, Holland, and also in England, early in the seventeenth century. About this time many artisans and others were driven out of the Netherlands by religious persecution, and sought shelter in England. Some of them settled in the east end of London, and others in Lancashire, where they started silk-weaving and other trades. They brought some of the flowers they loved with them; in this way the Auricula, amongst others, found a home in England. Gerard in 1597, and Parkinson in 1629, both described and figured the Auricula. It is needless to explore the pages of Gerard and Parkinson for descriptions, as it is beyond question that they described the show Auricula, with foliage both green and hoary, and with flowers of very varied colours, white, yellow, red, and purple. Parkinson describes about twenty of what he termed Beare's Eares. The greater number had mealed foliage, but some had the foliage green; and, from the descriptions, we are left in doubt whether they were

only progeny of *P. Auricula*, or whether some of them had come in ordinary generation from *P. pubescens*. Evidently the Auricula had taken its place as a choice garden flower in England early in the seventeenth century, and to an admirer of this choice and lovely garden favourite, it is most interesting to trace its development in its selfs and its striped and, later, edged forms, from the time of King James I. of England and VI. of Scotland to the present time. Parkinson evidently loved the flower, and describes many of the varieties in his quaint vernacular, such as: "The Great Straw-coloured Beares Eare with mealy leaves, the Greater Yellow, the Great Yellow and Great Straw, the Blush Beares Eare, the Yellow Variable, the Dark or dun Yellow shaded purple. The Hair colour is of brownish Yellow shaded with a light purple." There also existed "a variable green Beare's Eare." Here we have a colour variation of some importance, as it may have been the first break into the choice present-day green-edged varieties. Parkinson's latest folio was published in 1656. Twenty years later, in 1676, John Rea published his complete "Florilege," but it was evidently not a period of much progress. Rea describes the Auricula as a nobler kind of Cowslip. He was evidently acquainted with the work of Clusius, for he describes nine varieties of Auricula Ursi, as the older author had described *Primula Auricula* as Auricula Ursi I. and *P. pubescens* as A. Ursi II.

Rea certainly describes the show Auricula, as the varieties were stated to have white centres. One he described as the Black Imperial, with the margin almost black, and with a fair, snow-white eye, a very exact description of a present-day dark self.

The second edition of Sir Thomas Moore's "Flower Garden Displayed" was published in 1734. Here we have edged flowers described. One named Honour and Glory was described as having a white edge, and it may give some idea of the esteem in which the Auricula was held to recall that Moore mentions that one named the Royal Widow sold for ten guineas. Coming down to the middle of the eighteenth century, the true edged Auriculas were then in cultivation. In 1757, Pott's Eclipse, Hortaine, and Rule Arbiter were in the hands of the fanciers, and in 1785, Popplewell's Conqueror and Grime's Privateer.

The two last named I cultivated until quite recently, but, as newer varieties have been introduced, the eighteenth-century varieties have been turned out to find room for better ones. The varieties now in cultivation comprise a type more in accordance with the views of the present-day fanciers. The Southern Section of the National Auricula Society was formed in 1875, and the first exhibition of the Society was held in London in 1876. An exhibition has been held every year since, so that fanciers have an opportunity of meeting once a year and of comparing notes. In 1876–7 twenty-seven of the leading exhibitors and cultivators of the Auricula, under the leadership of the Rev. F. D. Horner, held an election of the best varieties of the show and alpine sections; each elector gave the names of those he considered the six best green, grey, white-edged, and selfs in the show section, and the six best alpines. The six best green-edged were: Colonel Taylor, 26 votes; Freedom, 22; Imperator, 19; Prince of Wales, 14; Anna, 14; Prince of Greens, 13. The six best grey-edged were: George Lightbody, 26 votes; Lancashire Hero, 26; Complete, 18; Alexander Meiklejohn, 16; George Levick, 10; Charles E. Brown, 9. The six best white-edged were: Smiling Beauty, 26 votes; True Briton, 23; Regular, 17; Glory, 15; Catherina, 14; Bright Venus, 14. The six best selfs were: Othello, 19; Pizarro, 18; Blackbird, 15; Garibaldi, 14; Charles J. Perry, 13; Meteor Flag, 12. The maximum number of votes might have been 27, but Messrs Horner and Simonite voted together. Out of the 48 varieties named above, two only, George Lightbody and Smiling Beauty, would have a chance to win in competition now; nearly all the others have gone out of cultivation.

I need not trouble to give the names of the alpine Auriculas, as all of them have long passed away.

As stated above, the show Auricula is divided into four classes or sections, viz.:—

I. *The Green-edged.*—The leaves of this section are always green, being destitute of farina. A truss of, say, from five to fifteen flowers is formed on each plant. The "pips" should be well displayed, and each individual flower or "pip" should be circular. The petals should be free from notches, the margin a well-defined green, and next to the margin the ground or body colour from reddish maroon to black; the centre white,

densely covered with meal, and, if possible, quite circular. The eye should be yellow, and filled with the anthers. The stigma should be well down in the tube, and not showing above, or even amongst, the anthers, for in either case the condition would be termed pin-eyed.

II. *The Grey-edged.*—This section is formed by the green margin being slightly powdered with farina, causing it to have the effect of being grey ; in all other respects the flowers are similar to those in Class I.

III. *The White-edged*—The margin in this section is more densely powdered with farina, causing it to appear white, but it is never so densely coated with meal as the centre of the corolla is.

IV. *The Selfs or Self-edged.*—In this section the margin is one unbroken colour only, dark maroon, red, violet, and yellow being the prevailing colours, but in all cases the centre must be circular, white, and the eye filled with the anthers. A "pin" eye is fatal.

The alpine Auricula is distinct in character. Whereas, in the show section, the foliage may be (except the green-edged) less or more coated with farina, in no case is farina found on the foliage or on the flowers of a true alpine. There are two distinct types:—

I. *The Yellow-centred Varieties.*—These have the centre of various shades of yellow, and the margin maroon, crimson, red of various tints, and bronze. The colour is darkest at the centre, shading to a paler tint at the margin.

II. *The White or Cream Centres.*—These are similar to the above as regards properties, but the colours are different; they range through purple, claret, lilac, and bluish tints. The eye, again, ought to be filled with the anthers, and the stigma must not protrude.

The culture of the Auricula is very simple, and does not require any great gardening skill. A garden frame is all that is needed, and the potting material is found in every garden. The best compost is good loam, four parts, one part decayed stable manure, and one part leaf mould, with sand if the loam is heavy.

The Auricula is propagated by offsets and by seed; the latter if new varieties are to be obtained. To obtain good results the

very best varieties should be cross-fertilised, the green-edged with green-edged, grey with grey, etc. As the mouth of the corolla is filled with the anthers laden with pollen, these must be cut off before the pollen scatters. The stigma will be found well down in the tube, and the pollen from another variety must be conveyed to the stigma with a small camel-hair brush. The Auricula flowers in April, or early in May, and the seed ripens in July. It ought to be sown at once, using the ordinary potting soil, but a depth of one inch on the surface should be finely sifted. Some of the seedlings will appear in two or three weeks. These may be pricked off as soon as they are large enough; but the soil must be pressed in again, as more seedlings will appear in the spring, even after twelve months or longer. Success in obtaining choice varieties cannot be absolutely guaranteed, even from the best varieties. One starts full of hope, and great is the excitement when the plants commence to flower, about eighteen months after sowing the seed. Some thirty-five years or more ago I started seedling raising, and had grown about a thousand plants from good crosses, but was able only to save one good enough to take a second place. I have been growing seedling Auriculas every year since, and some of them have come to the front. It is very fascinating, as all seedling raising is. The seedlings grow very slowly at first, but they go on freely after being potted off singly.

Offsets form very freely on some varieties, on others not so freely. I have a plant of a white-edged variety, John Simonite, which has not made an offset for six years, while Acme, a better white-edge, would produce sixty plants in that time—not all from the one plant, of course, but a stock of that number could be propagated from one plant. The offsets should be removed with a portion of root attached, and be planted round the edges of small flower-pots. They soon form roots, but it takes eighteen months to produce a full-sized plant. The Auricula being a mountain plant, it requires plenty of air. All plants do, I fancy, whether from mountain or plain. When the plants are well established, the frame lights should be drawn quite off, except in wet or very cold weather. Watering should be carefully attended to, and wetting the leaves of the varieties that have white-mealed foliage should be avoided. In autumn, and, indeed, as late as mid-winter, the outer foliage continues to die

off. This should be carefully removed when it becomes yellow, as the decaying leaves may cause rot in the plants. Green fly is a persistent enemy of the Auricula, especially the green-edged varieties, and if not destroyed as soon as it appears, great injury is caused. The best remedy is to fumigate with tobacco smoke in some form. The roots are also attacked by a very troublesome pest, the Woolly Aphis. This breeds freely on the roots if it once obtains a footing, but the vapour of the "XL All" destroys it in time, if frequently applied.

The month of April is an interesting and exciting time for the Auricula fancier. He watches the development of the trusses, and is careful to thin out the yet unexpanded flower-buds, so that no trusses be overcrowded with the fully developed flowers. The flower trusses seldom require support, as they are usually borne on stout stems, capable of holding them in an erect position.

When the flowering period is over, repotting should be attended to, and the plants placed in frames, the back of the frames being against a north wall or the north side of a dwelling-house. The Auricula is impatient of being placed in direct sunlight during the summer months. I do not know that there are any details I need enlarge on further. Some one asked a great artist what he mixed his colours with. The answer was prompt and to the point: "With brains, sir!" I repeat that Auricula culture is easy. Any gardener worthy of the name, or amateur interested in his plants, may be successful—with brains. A list of the best varieties now in cultivation is:—

Green-edged.—Abbe Liszt, Abraham Barker, Shirley Hibberd, Mrs Henwood, Prince Charming.

Grey-edged.—Amy Robsart, George Lightbody, Marmion, Olympus, George Rudd, Richard Headly.

White-edged. — Acme, Conservative, Heather Bell, Mrs Dodwell, Rachel, Smiling Beauty.

Selfs.—Andrew Miller, Gerald, Mikado, Mrs Phillips, Mrs Potts, Harrison Weir.

The best alpine Auriculas are:—Argus, Dean Hole, Duke of York, Firefly, Flora M'Ivor, Mrs Douglas, Phyllis, Mrs Markham, Perfection, Rosy Morn, Teviotdale, The Bride, Thetis, Uranie.

There are better varieties still in the hands of the raisers;

but no assurance can be given that they will maintain the first promise of goodness, displayed in their "maiden" form, as seen on the exhibition table. I know one exhibitor of show Auriculas who has obtained at least twenty first-class certificates for varieties during the last thirty years, and none of these certificated plants have been "sent out." It is needless to give the names of Auriculas which cannot be purchased. Every variety named in the above lists may be obtained through the usual trade channels.

ERYTHRONIUMS.

By S. Arnott, Sunnymead, Maxwelltown, Dumfries.

Erythroniums, or Dog's-tooth Violets, have been cultivated in British gardens for many years, but it is to be feared that for some time they have been under a cloud of neglect, although the more recent introduction of many beautiful American species has done much to restore these charming flowers to favour, and at present an increasing number of garden lovers are adding these plants to their gardens. As is generally known, the Erythroniums belong to the Liliaceæ, a family which has given us many of the most beautiful of our garden flowers.

So far as can be traced, the Erythronium came into notice as a garden plant about the middle of the sixteenth century ; for Gerard, in referring to it, says : "There hath not long since been found out a goodly bulbose plant, and termed Satyrion." It is considered that it may have been brought to England by Lobel, as it was in 1570 that he settled down in charge of Lord Zouch's garden, and we find that it was cultivated by Gerard in 1596. It was referred to, under the name of "Pseudohermodactylus," by Matthiolus, who died in 1577, and by Gesner, who died in 1565, as "Hermodactylus." It is to Clusius that we are said to owe the inception of the name of *Dens-canis,* as he applied to the plant the name of "Dentalia." It was later called *Dens caninus*, or Dog's-tooth Violet, from the shape and colour of the root, which bears a considerable resemblance to the tooth of a dog. The same idea is current in several other European countries, practically all their peoples adopting the name of "Dog's-tooth" in their own languages.

Parkinson, in his "Paradisi in Sole Paradisus Terrestris," figures two varieties of the Erythronium, and describes three under the heading of "*Dens caninus,* Dog's-tooth Violet." He remarks : "Vnto the kindes of Orchides, may fitly be ioyned another plant, which by many is reckoned to be a Satyrium,

both from the forme of root and leafe, and from the efficacy or vertue correspondent thereunto." As he remarks that it cannot be the "Satyrium Erythronium" of Dioscorides, he gives it a chapter to itself, and describes, with his wonted detail, three varieties: "*Dens caninus flore albo*, Dog's-tooth Violet with a white flower; *Dens caninus flore purpurascente*, Dog's-tooth with a pale purple flower; and *Dens caninus flore rubro*, Dog's-tooth with a red flower." His descriptions are very accurate, and to the uninitiated much more easily understood than those of the ordinary botanist; while the illustrations give satisfactory representations of the plants and flowers, including the marking of the leaves so characteristic of the European and most of the American species.

It was not until 1665 that the first of the American species was introduced. This was *E. americanum*, which has not proved so satisfactory as many, because of its irregular blooming—a feature which will be referred to later; but it is interesting to find that this species is mentioned in "The Florist's Vade Mecum," which forms a part of the second edition of "The Scots Gard'ner" of John Reid, published in 1721, and which is understood to be by "another hand" than that of our first Scottish garden writer. He thus refers to the flower: "Dog's-tooth Violet, there are of them White, Red, and Yellow, it riseth with two spotted Leaves, a stalk about six Inches high, bearing one Flower upon it, hanging down the Head with six narrow long Leaves, like to a Cyclamen, turning up again to the Stalks, and flowers in March and April. It loves a light Soil not dunged, and is increased by Off-sets set in August."

In the second edition of his "Scots Gardiner's Director," published in 1721, James Justice has wonderfully little to say of the Erythroniums, which he treats of with the Fritillarias. He remarks: "Of *Dens-canis* there are two or three sorts, viz. the white-flowered with the broad leaf, is most common in Britain; its leaves make a very pretty Show in the Spring, and are by far preferable to others of these Sorts of Flowers, whose Colours are neither strong nor florid, so as to attract the Eye." Justice arranged this white Erythronium with the Fritillarias, but while he paid much attention to raising the latter from seeds, he says that he did not sow those of the Erythroniums. Since his time several varieties of the European Erythroniums

have been raised, and these have mostly originated in Holland or France.

Succeeding *Erythronium americanum* came *E. revolutum*, called at that time *E. grandiflorum*, but not the true plant, and introduced from North-West America in 1786. Next, in 1824, came *E. albidum*, while the others in cultivation, whose date of introduction is seldom chronicled, followed some time afterwards, the majority dating from about the end of the last century. It may be mentioned that when Mr J. G. Baker gave a monograph of the genus in the "Journal of the Linnæan Society," in 1873 (vol. xiv.), only five species were known. In 1897 Mr Baker added another to the many obligations students of such plants owe to him, by publishing, in "The Gardeners' Chronicle" of 8th May, a valuable note on the American species of the genus, giving a thorough revision of the nomenclature, etc. This has been followed in the following references.

Erythronium Dens-canis.

This, our common Dog's-tooth Violet, is one of the most valuable and accommodating of the genus, and in the varied colours we possess is a charming plant in March and April. There are two broad types, the ordinary or smaller-flowered form, and that called majus, together with some of the latter which have been given varietal names. To these may be added the Japanese form *E. Dens-canis japonicum*, with violet-purple flowers with a dark spot at the base of the segments; and the fine *E. Dens-canis sibiricum*, from the Altai Mountains, having rosy purple flowers with a yellow eye and a band of purple crimson at the base of the segments. It is almost unnecessary to detail the several varieties of this old and very beautiful flower, whose leaves, marbled or spotted with white, look so charming in themselves, and whose Cyclamen-like flowers are delightful in their time, although their blooming period is all too short for those who admire these blossoms. In grass they are charming, and there they generally thrive admirably if the leaves are allowed to ripen off naturally, which they do in a very short time. The colours vary from white to various shades of red, purple, and almost blue. Among the best of the varieties in cultivation, in addition to the other majus forms, are Franz Hals, purple; Pepin, rose; La Neige, white; and one called

Rouge Trappeuse, red. The finest of all, "The Queen," is not in commerce as yet.

The forms of *Erythronium Dens-canis* are more easily cultivated than the American species, and will do with rather more sun than the latter. They like a light, loamy soil, and in stiff loam are benefited by the addition of some leaf-soil or peat. The common Dog's-tooth Violet, which is abundant in some parts of the Continent, is a lovely plant in grass, where its variegated leaves and pretty flowers harmonise well with the green carpet through which they appear. It is best planted as early as possible after the leaves have withered, but may be removed at any time up to October. All the Dog's-tooth Violets should be as short a time out of the soil as possible.

The American Species.

Although arranged by Mr J. G. Baker in two divisions, viz. Eastern and Western species, for reference, they will be more conveniently discussed alphabetically. They are all exquisite plants, generally even more graceful than the European species, inasmuch as their flowers seem in better proportion to the stature of the plant.

They are excellent plants for rockwork, and are also suitable for grass where the soil is not too heavy. They like partial shade and a rather moist position, although one which is thoroughly well drained. They require to be planted as early as they can be procured, which will generally be in October; and in planting, a little sand should be placed about the roots, which, like those of the other Erythroniums, should have the crown placed about three inches below the surface. It must be observed that the sharp portion of the root, or what looks like the apex of a cone, should be uppermost.

Erythronium americanum.

This species, although long introduced, is not generally a success in our gardens, and it is thus but seldom seen in flower.

This is largely due to its producing small offsets, which go deeply down into the soil and cannot flower. This peculiarity has been the subject of considerable study, and a valuable

paper upon this Dog's-tooth Violet, with especial reference to this point, appeared some years ago in an American scientific periodical.

For cultural purposes, however, detail of this fault is unnecessary, and it may be said that *E. americanum* seems to flower more freely if a large flat stone is placed about three or four inches below the corm, so as to prevent the descent of the offsets. These are produced from the base of the corm, which is the cause of this fault of shy flowering. It has bright yellow flowers and rather elliptical-lanceolate leaves, dotted with white and violet. It grows from three to six inches high, and has only one flower to a scape.

E. albidum.

Allied to this, and with much the same general character, is *E. albidum*, which has white instead of yellow flowers, these being slightly tinged with blue or purple. The flowers are of good size, and the leaves prettily marked. It also produces its offshoots from the base, and is a native of the east of North America.

So far as I know, *E. mesochlænum*, which is very closely allied to *E. albidum*, and *E. propullans*, which has small rose-flowers with a yellow base, are not at present in commerce. The second comes from South Ontario and South Minnesota. Their absence is less to be regretted, as we have so many superior Western forms of the Dog's-tooth Violet.

E. Bolanderi.

This is one of the Western species, coming from the Sequoia region of California, but is not at present in ordinary commerce, and it need not, therefore, have much consideration. It has white flowers with a yellow centre, and is not sufficiently distinct to make its absence much regretted.

E. citrinum.

This, although rather a pretty species, always grows rather thin in substance for my taste, but it is, notwithstanding, a pretty Dog's-tooth Violet, generally with three flowers on a

scape, these being of a creamy yellow, with the base of the flowers of orange colour, the tips of the segments assuming a purplish colour in time. It comes from Southern Oregon. Its leaves are prettily mottled.

E. grandiflorum.

This is not *E. grandiflorum, var. Smithi*, of Hooker, which Mr Baker considers identical with *E. revolutum* of Smith, but a different plant, and one, moreover, of great beauty, although its leaves are not mottled. It is a tall and ornamental species with pretty, soft yellow flowers. It is a native of Idaho, Washington, and British Columbia. The variety *nuttallianum*, sometimes given specific rank, and often sold as such, is more plentiful than the type, and has smaller flowers and a shorter scape.

E. giganteum.

Still more ornamental than *E. grandiflorum*, *E. giganteum* sends up tall scapes, which bear from three to six or more flowers; it is said occasionally to produce twelve blooms on a scape, but the writer has never seen so many. These flowers are of a pretty, creamy white, with a bright orange or yellow base. It is sometimes offered as *E. californicum*, and comes from California and Lower Columbia. Its leaves are beautifully mottled, and it is one of the most ornamental of the American Erythroniums. White Beauty is a handsome variety of this species.

E. Hartwegi.

The chief merit of this Dog's-tooth Violet seems to me to consist in its earliness, as it is generally exceedingly thin in substance, and this renders its flowers more liable to injury at the early period at which it blooms. It likes, I am of opinion, a somewhat drier position than most of the other Erythroniums, and suffers less than they when in a sunny and sheltered position. It has prettily mottled leaves and very pale yellow flowers with an orange base. This species makes its growth so early that one finds there is a difficulty in preserving it, seeing that the foliage has in some winters been destroyed by late frosts. It comes from the Sierra Nevada of California.

E. Hendersoni.

This is a most ornamental little Dog's-tooth Violet with pretty flowers of a pale lilac or pale purple, with a deeper centre and a yellow base. It has prettily marked leaves, but does not care for too dry a position. A native of Southern Oregon, and readily procurable from the bulb dealers.

E. Howelli.

Another Erythronium from Southern Oregon, this species is not particularly distinct, with its pale yellow flowers, which become slightly pinkish with age, and which have an orange base. There are from one to three flowers on a scape, and the leaves are nicely mottled. It is procurable from the trade at a moderate price.

E. Johnsoni.

Some deny this plant specific rank, and class it as a variety of *E. revolutum*, but at present I prefer to follow the authority of Mr Baker. It is a very handsome plant and one of the most beautiful of all these American Dog's-tooth Violets, with its finely coloured flowers, which are variously described, according to the judgment of the writers, as "bright purple," "bright salmon pink," and "bright rose." The centre of the flower and the anthers are yellow.

E. montanum.

This is not, so far as I know, at present in commerce, unless under the name of *E. giganteum*, from which it mainly differs in having the segments more or less rounded or contracted at the base. It has white flowers with an orange base, and the blooms will frequently pass to pink as they fade. It is a native of the high mountains of Washington Territory and Oregon.

E. purpurascens.

This neat little species is rather more difficult to cultivate than many of its allies, and is best on a rockery, where it has moisture in spring, with free drainage and comparatively little water when at rest. It is in the hands of the trade, and is well worth trying, not only because of its creamy flowers with orange centre, the petals passing off pink, but also for its pretty leaves,

which are long and prettily tinted with shades of bronze. It is a native of the Sierra Nevada of California.

E. revolutum.

The last with which we have to deal is also one of the most variable and beautiful. This is *E. revolutum*, a British Columbia species, which should be largely cultivated in its various forms. As already mentioned, *E. Johnsoni* is sometimes included with *E. revolutum*, and there are other handsome varieties. What Mr Baker describes as the type has bright, mauve-purple blossoms and mottled leaves, but the flowers open lighter, almost bluish or light pink, in fact. The variety Watsoni has fine, creamy-white flowers, with yellow ring, and the leaves generally mottled with brown. Pink Beauty is a form differing little from the type.

These European and American Dog's-tooth Violets make charming plants in spring, and as, with few exceptions, they are hardy in the greater part of Scotland if planted about three inches deep, they are among the most valuable of the smaller plants of their class, giving much gratification in their season of bloom, and well rewarding the cultivator for the little attention required by the greater number.

THE STRAWBERRY.

By J. Jeffrey, The Gardens, St Mary's Isle, Kirkcudbrightshire.

As far back as the sixteenth century, this favourite fruit was to be seen in the gardens of the upper and middle classes, though not in the state of perfection to which it has attained in this era of high cultivation. The wholesome properties of the strawberry have no doubt aided largely in procuring for it the high degree of popularity which it has reached. Certainly, no garden fruit presents a more attractive and delightful appearance than a dish of large, luscious, and well-ripened strawberries arranged amongst their own beautiful foliage. To accomplish the successful cultivation of strawberries, particular attention must be given to the nature of the soil in the district where they are to be grown. In light soils strawberry plants quickly become exhausted, whereas, on strong land, beds will remain in a profitable condition for three years. The preparation of the strawberry plot is of the utmost importance, and should be considered long before the actual operation of planting takes place. Convenient crops to precede strawberries are early potatoes, turnips, or salads, as, in their cultivation, the land can be thoroughly cleared of weeds. During the winter before planting, the plot should be deeply dug and laid up roughly with the spade. The benefits of deep tillage are amply proved in droughty seasons. Where the ground has been gorged with farm manure, as is the case in many gardens, a liberal supply of lime will be necessary for the purposes of purification and of exciting into activity elements in the soil which, owing to its clogged condition, are lying dormant. The further top-dressing of such ground with decayed vegetable refuse collected from garden brakes is an excellent practice, provided the refuse heap has been previously turned and prepared. The cultivator's aim should be to obtain a fine tilth on the surface in which to place the roots of the

young plants, and the application quoted will be found conducive to this end. In the case of light soils a moderate quantity of farmyard manure may be incorporated with the soil at the time of digging. Too much manure will only encourage the plants to produce an excess of leaves, with no increase in the quantity of fruits. The application of farmyard manure should be supplemented by a dressing of nitrate of soda in the spring, if early crops are desired. In Scotland, however, these are at the best a risky venture, the boldest blossoms too often being blackened by late frosts or nipping winds. Peaty or boggy soils are not usually suitable for strawberry cultivation, though, when sufficiently drained and manured, they may be converted into such a condition that fair crops can be grown. These soils should not, however, receive dressings of lime. Of equal importance with the preparation of the strawberry plot is the care and attention demanded in the preparation and selection of runners: only the best rooted and strongest should be chosen for the purpose of forming plants. The best runners are obtained from year-old plants which have just borne their first crop of fruit. Unless the soil is very light, or the plants required for forcing, the use of turves or pots is an unnecessary practice, better results accruing from runners lifted direct from the bed. These should be carefully lifted by means of a hand fork, preserving every bit of root, with as much of the soil adhering to them as possible. Presuming that the ground has been prepared as advised, it will only be necessary to stir up the surface to the depth of about two inches before setting out the line for the marking out of the rows, the distance apart of which should be determined upon according to the strength of the soil. Two feet may be ample space to allow for a light soil, whereas three may be too little to allow for one of a heavy nature. When drills about one inch deep have been made, and the line removed, holes should be formed of sufficiently large dimensions to allow for the roots being laid out to their fullest extent, placing them in a radiating position, with the crowns of the plant central and quite clear of the soil. When the earth has been firmly placed among, and over, the roots, the young plantation should be thoroughly watered. A little dry soil sprinkled over afterwards will help to retain the moisture, and in a great measure prevent surface-

cracking. Should the weather be dry, watering will be necessary for a short time. Weeds and runners must be removed as they appear, and with an occasional stirring of the surface with a Dutch hoe, the young plants should make rapid progress. Planting must not be delayed beyond the first week of August, so that a crop of fruit may be gathered the following season. It may be superfluous to add that in cold and bleak localities young plantations are more satisfactory when formed in spring from runners that have wintered in a nursery bed. In many gardens mulching is a vexed question, suitable material for the purpose being often difficult to obtain. Clean straw may generally be procurable, but is frequently considered rather expensive. Short grass from lawns is sometimes used, but proves unsatisfactory, especially in wet seasons, a few wet days reducing it to pulp. Rough stable litter, if duly exposed to the air and thoroughly washed before being applied, is adaptable material. Even more suitable, however, is the coarse grass found growing in woods under trees, where it can be cut without an intermixture of weeds, or cut before the seeds have made an attempt to ripen. Whatever material is chosen, it should be carefully applied when the plants are in bloom, and on no account must any of the foliage be buried. Nets for the preservation of the strawberry crop may be placed over the plot in two different ways. They may be spread flat on the foliage, or, preferably, stakes from four to six feet high, and about twice that measurement apart, may be driven into the ground, and wires stretched across on which to lay the nets. Wooden pegs are then used to keep the nets close to the ground round the margin.

When it comes to naming varieties, they are so numerous that one cannot, without some hesitation, decide which are the very best to select; therefore, only those that have outstanding merits, and have been fully tested, need in the present instance be mentioned. The following varieties will ripen in rotation, and cover a lengthened strawberry season. First, Royal Sovereign, which is deservedly the universal favourite it has become. Its growth is vigorous, and its large fruits finely flavoured. President is an excellent strawberry, with dwarfed foliage, producing finely shaped fruits of excellent flavour, but is not so accommodating with regard to soils as the first-mentioned variety. Almost invariably grown is Sir

Joseph Paxton, an old variety combining many sterling qualities, not the least of them being its well-known one which has established its reputation as a good wet-weather strawberry. It should certainly be included in the list for most districts. Dumbarton Castle is a reliable, mid-season variety, producing finely flavoured fruits of high colour and medium size. British Queen is probably the finest-flavoured strawberry we have, but unfortunately every garden soil does not seem to suit its requirements, that of a deep rich nature apparently being the most suitable. Plantations of this variety must be frequently made, giving best returns when two years old, but becoming unprofitable afterwards. Latest of All, which belies its name, is a useful variety for supplying fruit between mid-season and latest gatherings. Its fruits are large, finely shaped, and well flavoured. Like the preceding variety, Latest of All should occupy the ground for two seasons only. Of very late varieties, Elton Pine takes first place with regard to flavour and constitution, Eleanor coming next in respect of flavour. Waterloo bears fine large fruits of dark colour, but, unhappily, of only second-rate flavour.

A paper on the Strawberry may not be considered complete without some allusion being made to its adaptabilities as an early forcing fruit. Limitation of space, however, prohibits treatment of this important part of its cultivation in the present instance.

POINT JUDGING OF GRAPES.

By Duncan Buchanan, Forth Vineyard, Kippen.

It is now some years since the leading Horticultural Societies introduced the point system in judging their principal collections of Grapes. Although but a short time on trial, there is every evidence that this new way has come to stay. Some good growers and exhibitors do not yet favour the point system, preferring the old haphazard way of judging, and think the new way too slow and complicated. This arises, no doubt, from a too hasty and superficial study of the subject. Like everything new, this system has to be learned, and requires careful study, until the details become fixed in the memory.

One great advantage of the point system, when properly carried out, is, that the exhibitor is no longer at the mercy of the fads and fancies of the judges, such as the well-known prejudice some have against the commoner sorts of grapes—though perhaps the most popular show varieties—as Alicante, Maroc, or Alnwick Seedling. Others, again, favour the large, showy kinds at the expense of quality. By the point system this is all done away with, and every bunch judged on its merits, as reflecting the skill of the cultivator. This is as it should be, for the most skilful cultivator cannot put a Muscat flavour into a Gros Maroc or Alicante. Nature has done this for some varieties, and the Societies, recognising the superior flavour of some over others, have classified them accordingly, and stipulated the maximum number of points that can be awarded to each section. The Royal Caledonian Horticultural Society's standard is:—a maximum of 10 points for Muscat of Alexandria, 9 for other Muscat-flavoured sorts, including Black Hamburgh, and 8 for all others. The Shrewsbury standard is practically the same, only it begins a point higher, or 11, 10, and 9.

Grapes can be judged by points in various ways, and judges generally come to an understanding as to the method to be employed. The plan of the Edinburgh and Shrewsbury

Societies, in employing the same judges for their Champion Cup Class, is, I think, a good one. The same men always working together, on the same principle, are more likely to come to a correct decision than if strange men were introduced each year; besides, knowing that they are appointed to such a high and important office, they will naturally take a keener interest in, and give more thought to, point judging of grapes in general than they otherwise would do. It is also an advantage to the exhibitor, who comes to know the style and class of bunch to place before them.

We will now consider some of the ways of point judging. The most common way, though not the most correct one, is just when you come to a bunch to say,—Well, what is the maximum here? (Say it is 10.) Well, what shall we give it? Is it worth 8? I think it worth more, says your partner; we gave a bunch of the same variety 8 further back, and I think this one better. You go back and compare the two, and find your partner is right, this one is a little better, so you decide on $8\frac{1}{2}$; and so on with the others in the collection. Now, though quite accurate decisions can be, and are, come to in this way, mistakes and inconsistencies are frequent. Strictly speaking, it is not point judging at all, but judging by comparison with the aid of points. An improvement on this way is to take all the varieties in a collection and judge them separately; that is to say—suppose you begin with Muscat of Alexandria, examine all the specimens of this variety staged in the competition, select the best bunch, fix the points you are to allow it, and grade the others down from this, going over all the others in the same way. This, though a very fair and certain way of arriving at the best collection, is rather slow, and entails a lot of trotting about; besides, it has the disadvantage of an exhibitor receiving, say, 8 points one year, and, though showing a better bunch of the same variety the next year—for the same prize—receiving only 7 for it, because the bunch was not valued on its individual merits, as it ought to be, but according to the quality of the bunches of this particular variety staged in the collection. To give a case in point: An exhibitor had in his collection a fairly good sample of Black Hamburgh. This variety was not well shown in the other lots, and the sample in question being the best, it received 8 points. The

following year the same exhibitor staged a much better bunch, and expected at least one half point more for it, the judges being the same, but he actually got 1 point less. The reason for this was that Hamburghs were particularly well shown, and several bunches were superior to his.

A better way than either of the foregoing, and one having a sort of fixed foundation to rest upon, is to allocate to every bunch four parts or qualities, give so many points to each part, add on the Societies' allowance for the variety, and you have the correct value of a bunch without having to compare it with others. The four parts are :—First, size or weight of bunch ; second, shape or form of bunch ; third, size and evenness of berry ; fourth, finish or bloom. To find the number of points to allocate to each section, we first get the Societies' maximums, which, in the case of Edinburgh, are 10, 9, and 8. This gives us 3, 2, and 1 points for variety, leaving 7 points to be divided into four equal parts, or $1\frac{3}{4}$ to each. The Shrewsbury maximums, being a point higher, give exactly 2 points to each section, but this makes no difference in judging. Let us take a bunch for an example, say it is Muscat of Alexandria. The maximum here is 10, thus—

	Maximums.	Value.
Variety . . .	3 2 1	3
Size . . .	$1\frac{3}{4}$	$1\frac{3}{4}$
Shape . . .	$1\frac{3}{4}$	$1\frac{3}{4}$
Berry . . .	$1\frac{3}{4}$	$1\frac{1}{4}$
Finish . . .	$1\frac{3}{4}$	$1\frac{1}{4}$
	10	9

The points for the variety must always be carried over in full to the value column. If the bunch had been in the 9 maximum class, 2 points would be taken over instead of 3 ; if in the 8 maximum class, 1 point. In the bunch under review, the size or weight is right, so full marks are placed opposite in the value column. It is also right in shape, and full marks are given here also. It has, however, but medium-sized berries, and so loses a half point here ; and the finish not being perfect, another

half point is lost on this. By adding up the value column, we get 9 points as the true value of the bunch out of a possible 10.

In considering one section we must guard against being influenced by glaring defects which may be seen in other sections. One thing at a time should be the maxim. When size is considered, no matter how ugly the bunch may be—and it may be poor in berry and have no finish at all—if it is the right weight for the variety, full marks must be given for this section, and so on with each of the other parts. In considering shape, account must be taken of how the berries are placed. They may be too crushed or too loose, or some parts may be ragged and badly feathered over the top—a common fault—showing bare stems. There are degrees of quality in berry, such as small, medium, large, and extra large. Finish has also its degrees. There is the bunch perfectly finished in bloom, but showing marks and blemishes which may have been caused in transit to the Show. Most judges who are, or have been, exhibitors themselves, ought to be lenient in regard to this fault. Still, marks must come off for every fault, no matter how caused. Then there is the bunch which never has been finished, and the one almost perfect in finish, which may lose only a quarter point on this head.

Although no hard-and-fast rule can be laid down as to weights, we may give for guidance a fair average weight to set up as a standard of well-grown specimens of the principal show varieties:—Muscat Hamburgh, 3 lbs.; Mrs Pince, 4 lbs.; Black Hamburgh, 4 lbs.; Madresfield Court, 4 lbs.; Muscat of Alexandria, 5 lbs.; Alicante, 6 lbs.; Barbarossa, 7 lbs.; Rasin-de-Calibre, 7 lbs.; Gros Maroc, or Cooper's Black, 4 lbs.; Golden Hamburgh, or Buckland Sweet Water, 4 lbs.; Gros Colman, 4 lbs.; Alnwick Seedling, 5 lbs.; Duke of Buccleuch, 3 lbs.; Canon Hall Muscat, 3 lbs.

Closely connected with the point-judging system is the one of awarding the money prizes according to the point value of the exhibit. This is a subject that was much argued and strongly advocated in a leading horticultural paper some years ago. I am not aware that any societies have adopted this plan. It is well worth consideration now. Never before were such valuable trophies or so great an amount of money offered in prizes for collections of Grapes.

Besides the handsome fifty-guinea cups of Edinburgh and Shrewsbury, the total of the money prizes are:—for Shrewsbury, 12 bunches, £62, 10s., and for Edinburgh, 8 bunches, £33.

At the last Edinburgh International Show the second prize lot was only one half point ahead of the third prize, and this lot only another half point better than the fourth, so that the three lots were almost equal in merit; yet the second prize received £10 and the fourth £3, a proportion out of keeping with the value of the exhibits. Were two or more exhibits to be equal in number of points, the money would be equally divided between them and no one would think this an innovation. The exhibitors would be satisfied, knowing that they had received the point-value of their respective exhibits. Why not carry out the principle to all the prizes? The first man would still have the honour of winning the Cup and Gold Badge, and there would be second, third, and fourth prizemen as at present; the only difference would be that each would receive the proportion of the prize-money which his exhibit deserved as ascertained by points.

This ought to be a popular change with exhibitors, and the Societies might be the gainers, as more competitors should enter.

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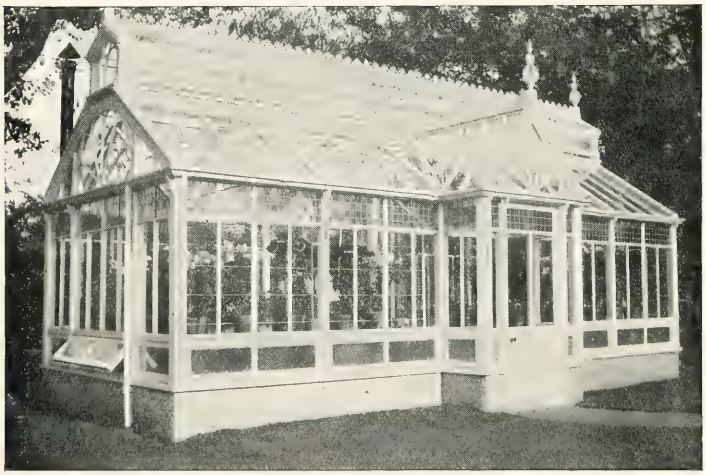

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CONTENTS—*continued.*

PAGE

THE PLANTING AND AFTER-MANAGEMENT OF HARDY FRUIT TREES AND BUSHES (*with Illustrations*). By GEORGE P. BERRY 118

THE DAHLIA (*with Illustrations*). By ROBERT FIFE . . 130

THE AURICULA, SHOW AND ALPINE. By JAMES DOUGLAS . 148

ERYTHRONIUMS. By S. ARNOTT 155

THE STRAWBERRY. By J. JEFFREY 163

POINT JUDGING OF GRAPES. By DUNCAN BUCHANAN . . 167

ILLUSTRATIONS

FACING PAGE

PORTRAIT OF PRESIDENT 83

GROUP OF COUNCIL, JUDGES, ETC., INTERNATIONAL SHOW, 1905 87

GENERAL VIEW AT INTERNATIONAL SHOW . . . 87

FIRST PRIZE DISPLAY OF VEGETABLES AT INTERNATIONAL SHOW 89

FLORAL DESIGN AT INTERNATIONAL SHOW . . . 90

FIRST PRIZE TABLE OF ROSES AT INTERNATIONAL SHOW 92

KING'S CUP 94

SCOTTISH CHALLENGE TROPHY CLASS OF GRAPES AT INTERNATIONAL SHOW 94

TWELVE DISHES OF FRUIT AT INTERNATIONAL SHOW . 96

EXHIBIT OF APPLES AT INTERNATIONAL SHOW . . 97

GROUP OF PLANTS EXHIBITED BY CORPORATION OF GLASGOW 98